

Financial 2/2013 Theory & Practice

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do we have only ourselves to blame?

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Fiscal determinants of government borrowing costs: do we have only ourselves to blame?

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Abstract

The global financial crisis and the problems in peripheral EU countries resulted in increased attention to fiscal developments and their impact on borrowing costs for both public and private sector. Existing theoretical literature suggests that worsening of current and expected budget balances as well as an increase of public debt lead to a rise in short and long term interest rates for sovereign debtors. However, empirical results are inconclusive, especially for emerging market countries. This paper analyzes the factors that determine the dynamics of government bond spreads, with special emphasis on fiscal indicators. The survey covered 17 European countries, of which 9 are developed and 8 are emerging market economies, all of them members of the EU except Croatia. The empirical part of the paper employs dynamic panel data method and uses the Arellano and Bond estimator to get consistent estimates of parameters of interest. The results show that in the period 2004-2011 fiscal balance and public debt projections had a significant impact on the differences in government bond yields for emerging market countries, with the effect being much stronger during the period after the onset of financial crises. On the other hand, it seems that sovereign spread dynamics in developed countries is driven mostly by the global market sentiment.

Keywords: sovereign bond spreads, expected fiscal developments, EU countries, Croatia

1 INTRODUCTION

After several years of convergence, sovereign yield spreads of EU countries relative to the German Bund in late 2006 and early 2007 reached historically low levels. The situation changed dramatically, however, with the onset of the global financial crisis in September 2008 when emerging market EU countries' bond spreads exploded and even developed market spreads recorded a significant rise. The question arose whether such a development reflected macroeconomic fundamentals, especially the fiscal positions of countries in Europe, or simply the global market sentiment. Did investors finally start to differentiate between countries according to the riskiness they attribute to them?

Trying to answer these questions, this paper analyzes the factors determining spreads among long term government bond yields of selected European countries and the German government bond using a dynamic panel model. We cover the main spread determinants recognized in the literature: credit risk, international risk aversion and liquidity risk. The fiscal position of a given government is considered to be the most important indicator of credit risk. However, it is the future solvency of the government that matters for the current bond holders so instead of current values our model includes forecasts of government balance and public debt. Besides capturing the forward looking feature of financial markets, using forecasts also solves the problem of possible endogeneity that may arise due to simultaneous determination of fiscal variables and bond spreads. To ensure the

robustness of the results, our analysis also includes other potential indicators of country credit risk, i.e. GDP growth and current account balance.

Given the availability of the data on government bond yields, the survey covered 17 European countries, of which 9 are developed and 8 are emerging market economies, for the 2004–2011 period. Both the analyzed period and the sample of countries contribute to the existing literature, because we include the period before as well as after the onset of the financial crisis which enables us to investigate whether the determinants of sovereign spreads have changed over that time. It is also interesting to see whether the spreads of developed and emerging market countries that are part of a common market with a high level of financial interlinkages are driven by the same factors.

The remaining part of the paper is organized as follows. The second part briefly explains the basic theoretical determinants of government bond spreads and gives a short review of the empirical literature on government borrowing costs, with special emphasis on the studies that include fiscal indicators in the analysis. The next section describes the data used in our analysis, as well as the sources and methods of calculating certain variables. It also summarizes the basic characteristics of the spread and selected fiscal indicator movements for the observed countries during the reference period. In the fourth chapter empirical methods and the results of the estimated model are presented. The conclusion and policy implications of the results are presented in the last chapter.

2 LITERATURE REVIEW

In the past decade, many studies tried to identify the main determinants of government borrowing costs over some “risk free” interest rate. Many different variables were included in empirical models, from the usual macroeconomic indicators and their expected values, such as GDP, inflation or different measures of external vulnerability, through variables indicating the quality of institutions and political risk, as well as indicators that reflect the developments in global financial markets. Although certain problems with the availability and quality of fiscal data are often mentioned, almost all the authors who explore government bond spreads use a measure of fiscal balance and the data on public debt as a primary measure of a country’s credit risk, and hence one of the fundamental determinants of the required yield on government bonds.

The difference between government bond yields for different countries and the yield on a selected reference “risk free” bond represents the premium required by investors to include a certain bond in their portfolios. Financial theory suggests that this premium reflects the credit risk, liquidity risk and general risk aversion in the market at a given time. Therefore, empirical studies try to determine how much of the premium is determined by the particular type of risk and how the

relative importance of each type of risk varies depending on the group of countries or the time period included in the analysis.

2.1 CREDIT RISK

Empirical literature indicates that at a time of financial market turmoil and in periods of greater uncertainty, market participants devote significant attention to the country credit risk focusing on macroeconomic and fiscal differences among countries.¹ This kind of risk can be broadly defined as the risk of a government's inability or refusal to make the required payments on its debt and is often called the risk of default. Creditworthiness or solvency of the country largely depends on the current and expected state of the actual and potential debt and its sustainability. Debt sustainability in turn depends on the expected budget surpluses/deficits, as well as on the expected economic activity and interest rates, which are affected both by domestic and international factors and policies (Codogno et al., 2003). If the market perceives that there is a possibility that the government will not be able fully and/or in time to meet all its financial obligations, the investors will demand a higher premium for increased credit risk.²

In the empirical literature it is the credit risk that gets most attention. This can be explained by the fact that variables indicating a country's creditworthiness are to some extent under the control of domestic policy makers. So countries conducting prudent fiscal policies can to some degree positively affect the cost of borrowing for both the public and the private sector. Many authors have therefore dealt with the influence of fiscal balance and public debt on the cost of government borrowing. However, econometric methods and measures of fiscal balance, public debt and long-term interest rates often differ, and therefore the results are ambiguous.

Gale and Orszag (2003) reviewed 58 studies investigating the impact of the U.S. fiscal deficit on the long-term interest rates and showed that only in slightly less than half of these studies was a significant positive impact defined. However, they state that studies that use projected instead of the current fiscal deficits more often tend to show statistically significant effects of these variables. A significant effect of fiscal policy in the U.S. on long term interest rates was found in later studies as well (see, for example, Engen and Hubbard, 2004; Dai and Phillipon, 2005; Laubach, 2009).

The influence of fiscal variables on long term interest rates was also estimated for other countries. Faini (2006) examines the impact of the current cyclically adjusted primary balance and public debt of 11 EMU member countries on the aggregate eurozone interest rate level and also on government bond spreads for individual countries. This model specification, according to Faini, stems from the fact that changes in domestic fiscal variables affect individual country spreads, but

¹ See for example Ejsing and Lemke (2009) and Sgherri and Zoli (2009).

² As can be seen in the recent Greek case.

through a spillover effect, they also affect the overall level of eurozone interest rates. The results show that changes in the EMU budget deficit have a much stronger effect on the aggregate level of interest rates than the increase in the budget deficit of individual countries on their spreads, which indicates significant spillover effects. Also, the public debt on a country level has no impact on their spreads, while for the eurozone as a whole it proved to be significant.

Baldacci and Kumar (2010) analyze the impact of fiscal balance and government debt on ten-year government bonds yields for 31 countries (developed and developing countries) for a period of almost thirty years. The authors showed that the effect of deterioration in public finances on long-term interest rates is significant and robust, but not linear. Moreover, the strength of the impact depends on the initial fiscal, structural and institutional conditions. The authors estimate that, especially in developing countries, debt servicing costs will significantly rise if reforms that leading to a reduction in government expenditure growth (e.g. pensions and health) are not carried out.

Alexopoulou et al. (2009) study the determinants of differences between bond yields for Central and Eastern European countries that are members of the EU and the average eurozone government bond yield over the period 2001 to 2008. Using a dynamic panel (error correction) model the authors conclude that the main long run determinants of spreads are external debt as a percentage of GDP, trade openness, the difference between short-term interest rates of the countries analyzed and corresponding short-term rates in the eurozone, exchange rate, inflation and global financial terms (measured by stock market volatility index). In addition, to check whether investors perceive selected countries differently, they divide them into two groups. For the first group, which is characterized by better macroeconomic fundamentals, they conclude that the main drivers of the rise in spreads are inflation rates and short-term interest rates. On the other hand, fiscal fundamentals have important influence on spreads for countries that are characterized by pronounced external vulnerability.

Nickel et al. (2009) investigated the impact of fiscal variables on government bond spreads in the Czech Republic, Poland, Hungary, Russia and Turkey. Since market expectations are important for the movement in yields, as independent variables they used projected fiscal data taken from Consensus Economics forecasts. Although the results of the panel data analysis indicate a significant impact of fiscal variables on the difference in yields, the regression analysis for each country shows that the deficit is statistically significant only for Hungary and Russia. The authors conclude that the variables used in the empirical literature to model the government bond spreads probably represent only a small fraction of the market indicators that are monitored, and they highlight indicators of domestic and external political risks as variables that are particularly important and yet difficult to measure.

Cota and Žigman (2011) also focus on the influence of fiscal policy on government bond spreads for nine “new” EU countries and also Mexico, Russia, Turkey, Ukraine and Croatia. They estimated a regression model with panel data using a seemingly unrelated regression approach and showed that deficit and the ratio of domestic debt and total public debt have significant influence on spreads before and after the crisis.

2.2 GENERAL RISK AVERSION

The general risk aversion is associated with the overall willingness of investors to bear the risk. A higher required yield indicates a lower risk appetite or higher general risk aversion at some point in time. Even without any empirical analysis it seems that this indicator plays a very important role in determining borrowing costs for governments. This conclusion is supported by relatively similar dynamics of government bond spreads during the specific time periods, regardless of the fact that the macroeconomic and fiscal positions of the issuers sometimes differ considerably. It should be noted that there is no single or commonly accepted measure of risk aversion so empirical studies use different variables that in some way reflect market sentiment towards risk.

By using the method of principal components and information about the differences in corporate bond yields and the measure of volatility in the stock and foreign exchange markets Barrios et al. (2009) constructed an indicator of general risk aversion. They analyzed the data for ten eurozone countries in the period from 2003 until 2009 and concluded that global factors, especially the general perception of risk, are the main determinants of government bond spreads. On the other hand, the role of domestic factors such as macroeconomic fundamentals and liquidity risk associated with bonds of each country is small but not negligible. Similar results were also attained by Haugh et al. (2009) who measure general risk aversion by the difference between yields on corporate and government bonds of the eurozone. They show that, even though fiscal variables have a statistically significant effect on the dependent variable, in the majority of specifications the indicator of general risk aversion can explain most of the differences in yields and it considerably amplifies the effects of other variables included in the model.

The importance of market sentiment was also confirmed by Ebner (2009) who used data on Central and Eastern Europe government bond spreads. He shows that market sentiment measured by VDAX-NEW index, the ECB reference rate and market liquidity have a dominant effect on selected countries spreads, while variables that reflect macroeconomic and fiscal developments in most countries showed not to be statistically significant. Codogno et al. (2003) also analyze European countries in the period before and after the introduction of a common currency. As a measure of risk aversion they use the difference in yields of U.S. high-grade corporate bonds and the U.S. ten-year government bond. Their results imply that the difference between government bond yields of these countries in

relation to the German government bond could only in Italy and Spain partially be explained by domestic macroeconomic factors, while in other observed countries spread movements are explained by external factors, in other words, a risk aversion indicator.

Based on the data for eight European emerging countries, Dumičić and Ridzak (2011) investigated to what extent the latest financial market turmoil that affected sovereign bond spreads could be related to the changes in risk appetite and the nature of the impact of domestic macroeconomic variables, with a special focus on external imbalances. They show that spread movements can be explained both by market sentiment measured by Deutsche Börse volatility index (VDAX) and macroeconomic fundamentals, emphasizing that external imbalances did not result in any significant effect before the crisis, but became very important after the crisis broke out.

2.3 LIQUIDITY RISK

The impact of liquidity risk, one of the theoretical determinants of the differences in yields, has also been the subject of numerous investigations. A liquid market is defined as a market with a sufficiently large number of orders for purchase and sale (market depth) and where large transactions have no significant impact on the price (market breadth). As with credit risk and general risk aversion, empirical research does not give the same answer to the question of how liquidity affects the differences on government bond yields.

Schwartz (2010) analyzes the movements in yield differences of eurozone member countries during the last financial crisis and seeks to determine whether the result of their increase is a consequence of a higher credit risk or reduced market liquidity, that is, increased liquidity risk. The author concludes that liquidity risk can explain a great share of the increase in yield differences during the last financial crisis, in some cases up to 90%. She believes it is possible that the investors assumed EMU would not allow a default of its members, which then reduced the credit risk. In addition, she believes this high contribution of liquidity risk to spread increase is a result of the used liquidity measure, which, besides the transaction costs, also includes the price of liquidity risk. In contrast, Codogno et al. (2003) show that in the model specifications in which a measure of liquidity risk is statistically significant, its contribution to yield spreads is weak.

3 DESCRIPTION AND ANALYSIS OF THE DATA

3.1 CHOICE OF VARIABLES

The empirical analysis covers the period from the first quarter of 2004 until the fourth quarter of 2011, capturing the period before and after the financial crisis. Even though the original intention was to include all countries of the EU plus

Croatia, due to data availability our sample was reduced to 17 European countries, nine of which are developed and the rest are emerging market economies.³

The dependent variable in our model is the average quarterly sovereign spread relative to Germany. It is calculated as the difference between yield to maturity of comparable generic eurobonds for each country in the sample and the yield to maturity of a comparable benchmark generic German government bond on the basis of daily data. Data on yield to maturity for generic government bonds have been taken from the Merrill Lynch database. Generic bonds are used to create artificially yield to maturity time series, which is formed by connecting bonds with certain characteristics (currency, maturity, etc.). In this way, the yields on individual bonds are not monitored, since they change due to, *inter alia*, the changes in bond's time to maturity. Therefore, we use yields on bonds which do not exist in reality, but enable us to track the cost of long-term borrowing for individual countries over time.

To account for the credit risk the emphasis was put on developments in public finances and the main indicators used in the model were fiscal balance and public debt to GDP ratios.⁴ However, since financial theory suggests that it is expected future rather than current developments that are more relevant for yield formation, we have used European Commission (EC) fiscal projections as a measure of market expectations. Given that the EC publishes its detailed projections twice a year, quarterly series are constructed in such a way that in the second and the fourth quarter, when projections are published, the variable takes the average value of the published projections for the current year and subsequent periods (in the second quarter that is one year ahead and in the fourth quarter two years ahead)⁵. On the other hand, the data for the first and the third quarter were obtained as the average of the calculated values for the previous and subsequent quarter.⁶ In such a way we capture, at least to some degree, medium-term market expectations of fiscal developments, but we also allow the possibility that market participants will change their expectations in between two EC projections as the rational expectations theory would suggest.⁷

Besides fiscal indicators we have also used some other macroeconomic variables that reflect the credit riskiness of a country. To take into account a country's exte-

³ Countries can be divided into two groups: the developed countries and emerging market countries. Developed countries from our sample are: Austria, Belgium, Denmark, Spain, Finland, France, Italy, Netherlands, and Sweden. Emerging market countries are: Bulgaria, Croatia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia. We decided to include in our analysis only those countries that have maintained market access in the whole sample period.

⁴ To assure fiscal data consistency we have used fiscal data from the Eurostat which are shown according to ESA 95 methodology.

⁵ E.g. for the second quarter of 2010 our observation is an average EC's forecast for 2010 and 2011. For the last quarter of the same year the average also includes 2012.

⁶ E.g. our observation for the first quarter of 2010 is an average of our observations for the last quarter of 2009 and the second quarter of 2010.

⁷ GDP and current account data were obtained and constructed in the same way as fiscal variables.

nal vulnerability, the expected current account expressed in percent of GDP was introduced in the model. The larger the current account the more vulnerable country is to a slowdown in capital inflows or sudden stops, so investors can be expected to demand higher yields on its bonds. Expected real GDP growth was also included in some model specifications. Higher GDP growth, *ceteris paribus*, means that the taxable base is expected to expand in the future and thus exert a positive influence on government solvency. This variable could also serve as a proxy for quality of economic policy making process in a referent country, so higher growth is expected to result in lower sovereign bond spreads.

Following the common practice in the literature we have used the Chicago Board Options Exchange Volatility Index (CBOE_VIX) as an indicator of risk aversion (or investor sentiment) on global financial markets. CBOE_VIX measures implied volatility of the S&P500 index option prices and is commonly used as a measure of market expectations and global investor sentiment.

Since we have used the spreads on generic bonds in our model, the usual direct liquidity indicators for market instruments such as bid-ask spreads or trading volumes for a specific bond are not available. Therefore, we have decided to use an indirect liquidity indicator, following Barbosa and Costa (2010), who calculated the relative size of each country's government bond market. Using the data on the structure of public debt, we have calculated the share of an outstanding amount of a specific government's bonds in the total amount of outstanding debt securities issued by the observed countries in a certain period. Another possible solution might be to try to obtain information on the underlying bonds used for calculating the generic bonds for each country, but it is still questionable whether data obtained in such way would provide information on the liquidity of country bonds.⁸

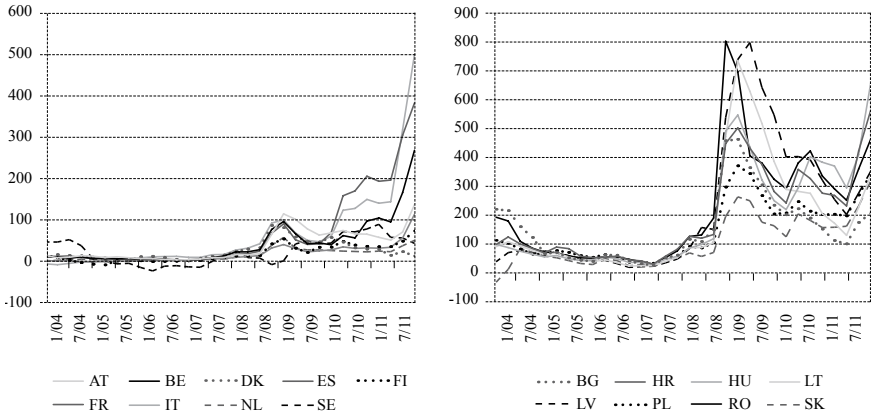
3.2 DATA DESCRIPTION

In the period from 2004 until the crisis, sovereign yield spreads to German government bond generally co-moved and converged to the historically low levels reached during 2006 and 2007. However, after the escalation of the financial crisis in the last quarter of 2008 emerging market countries' bond spreads exploded. After a few months they started to decline again, but remained at levels higher than in the period before the turmoil in financial markets. Spreads for the majority of developed European countries also increased at the onset of the crisis, but in much smaller amounts. The exceptions are the spreads for Spain and Italy and partly Belgium, where risk premiums increased significantly due to investors' concerns about the long-term sustainability of their budget deficits and public debts, which increased substantially during the recession, as well as because of the political uncertainty.

⁸ For potential problems see Barbosa and Costa (2010:9).

FIGURE 1

Difference in government bond yields of selected European countries and the benchmark German government bond



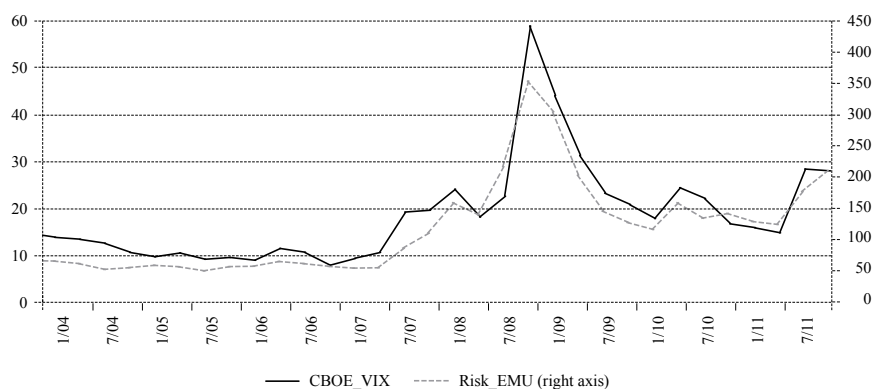
Sources: Merrill Lynch; authors' calculation.

Similar developments (relatively positive till 2007 and adverse afterwards) were recorded also in the area of public finances in most of the selected countries. The fact is that the most of the observed countries were in a long expansion that lasted till 2007 and had a favorable effect on budget revenues. Therefore, in this period countries generally exercised relatively low levels of budget deficit and some even a budget surplus. It should be pointed out that cyclically adjusted budget balance figures show less favorable developments. Nevertheless, relative debt indicators for most of the countries were more favorable at the end of 2007 than at the beginning of the observed period.

However, the escalation of the financial crisis and its spillover into the real sector of the economy ultimately led to the deepest recession in the post-war period. In such circumstances the influence of the automatic stabilizers led to a sharp fall in government revenues. Additionally, the fiscal authorities of the most developed EU countries tried to alleviate and reverse the adverse economic trends by implementing different fiscal stimulus packages, and many of them had to inject substantial funds into the financial system to preserve its stability. This resulted in an increase in state spending. On the other hand, the countries of Central and Eastern Europe generally could not afford significant stimulation of their economies with their budget resources. Smaller packages of fiscal stimulus were recorded only in Slovakia, Slovenia and Poland while countries like Hungary, Croatia, Romania and Latvia trying to stabilize their public finances actually implemented pro-cyclical measures. This was also demanded by the international financial institutions that provided conditional financing during crisis period.

After the collapse of Lehman Brothers risk aversion on the global financial markets increased significantly. Figure 2 shows two indicators of risk aversion. The first one measures the difference between yields on generic corporate bonds in the eurozone countries, excluding financial companies, and the yield on comparable generic German bonds (Risk_EMU). The second one is the Chicago Board Options Exchange Volatility Index (CBOE_VIX), which measures implied volatility of S&P500 index option prices and is used in this paper to capture investors' risk aversion.⁹ Figure 2 shows that even before the onset of the financial crisis in Europe risk aversion indicators started to rise due to adverse developments in the U.S. subprime mortgage market. In the first months after the collapse of Lehman Brothers the level of risk premium reached a prohibitively high level and some of the countries in our sample lost access to international capital markets. In such circumstances, to avoid defaulting on their debt, countries like Hungary or Latvia got international financial help but were forced to implement severe saving measures.

FIGURE 2
Risk aversion indicators

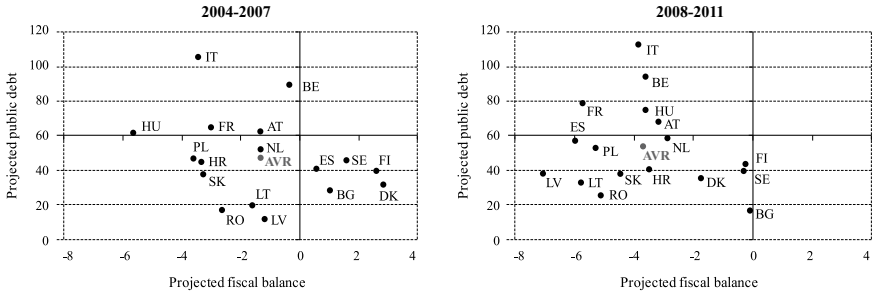


Sources: Bloomberg, authors' calculation.

Regardless of whether it was the effect of automatic stabilizers on the revenue side and/or increased costs due to the banks rescue and stimulation of economy, in all countries under review there was a noticeable deterioration in fiscal balance, and consequently the public debt (figure 3). Average projected fiscal deficit in the period from 2004 to 2007 was around 1.5%, but in the next three years increased to 4.2% of GDP, while projected public debt increased by about 8 percentage points. Looking at the end of 2010 public debt was on average about 18 percentage points higher than at the end of 2007.

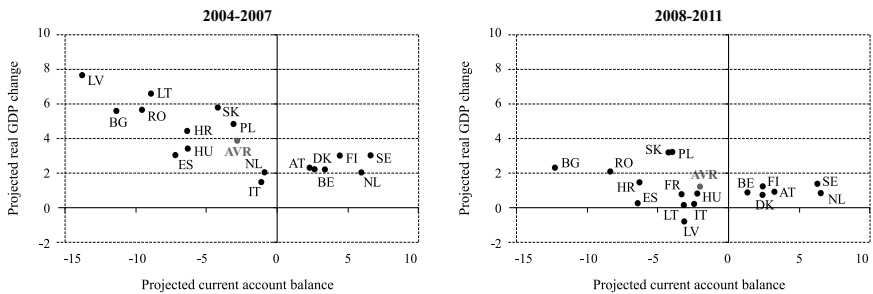
⁹ By using CBOE_Vix we avoid the problem of endogeneity which might be present if Risk_EMU is used instead.

FIGURE 3
Fiscal developments before and after the onset of global financial crisis



Note: Left panel shows average expected fiscal balance and public debt in the 2004-2007 period while right panel shows figures for the same variables in the 2008-2011 period. AVR = average.
Sources: Eurostat, MF, CNB.

FIGURE 4
Growth prospects and external imbalances before and after the onset of global financial crisis



Note: Left chart shows average current account balance and average real GDP change in the 2004-2007 period while right panel shows figures for the same variables in the 2008-2011 period. AVR = average.
Sources: Eurostat, CNB, authors' calculation.

Not only fiscal indicators showed significant worsening during the last crisis. Average GDP growth decreased significantly during the crisis. During the 2004-2007 period it amounted to 4.5% annually and then plunged to -1.0% on average during the subsequent three years. As can be seen from figure 4 average projected GDP growth also significantly decreased. It is worth pointing out that in 2010 most of the countries in the sample experienced a mild growth, and only Romania and Croatia were still on a downward trend. Overall, such a development added to investors' concerns regarding medium-term sustainability and could partly explain the high level of yield spread in that period. On the other hand, external imbalances measured by the current account balance somewhat shrank, especially in

the emerging market countries mostly due to a significant fall in imports. It seems, however, that this did not offer much comfort to global investors since external indebtedness continued to rise.

Before econometric analysis it is useful to look at linear correlation coefficients between sovereign yield spreads on one side and potential explanatory variables on the other for two subperiods. Table 1 shows that for emerging market countries correlation coefficients between indicators of credit risk (except current account), liquidity risk and general risk aversion on the one side and government bond yield spreads on the other mainly show expected signs both before and after the onset of financial crisis. What is interesting is that correlation between fiscal variables and spreads for most countries was much stronger before than after the crisis. On the other hand, correlation coefficients suggest a more important role of general risk aversion after the onset of the crises. This is to some extent contrary to the general belief in non-discriminating financial markets before the crisis. However, it is impossible to say whether this was really the case without a detailed econometric analysis that takes into account all the interlinkages between the explanatory variables.

Results for developed countries indicate that before the crisis investors' risk aversion played the most important role in determining the spreads, while results for other variables are mixed with both positive and negative signs of correlation coefficients. And even if the sign is right, correlations are weaker than for emerging market countries. However, this is something that might have been expected. It should be borne in mind that prior to the crisis most developed countries in our sample had the highest credit rating (only Belgium and Italy had a double A rating). Investors probably saw these bonds as close substitutes and did not pay too much attention to the macroeconomic and fiscal developments. Data on spreads seem to support such conclusion; in only five percent of the cases in this period were spreads larger than 10 basis points. So it seems that decreasing level of risk aversion played a more important role in this period, as suggested by the relatively high correlation coefficient between sovereign spreads of most of the countries and the VIX index. The financial and sovereign debt crisis in the EU seem to change that significantly. In most cases, correlation coefficients between fiscal indicators, especially public debt, and sovereign spreads now have the expected sign, and it seems that the relation is somewhat stronger than before. On the other hand, it seems that correlation between general risk aversion and spreads has weakened.

TABLE 1

Correlation coefficients between sovereign spreads and selected variables

	Projected fiscal balance		Projected public debt		Projected GDP growth		Projected current account balance		Indicator of risk aversion-VIX		Liquidity indicator	
	04-07	08-11	04-07	08-11	04-07	08-11	04-07	08-11	04-07	08-11	04-07	08-11
Austria	-0.26	-0.54	0.56	0.55	-0.56	-0.45	-0.44	-0.63	0.26	0.36	0.29	-0.14
Belgium	-0.13	-0.23	0.22	0.37	0.02	0.23	0.56	0.10	0.74	0.15	0.43	-0.64
Denmark	-0.46	0.14	0.22	-0.40	-0.39	-0.62	0.14	-0.61	0.60	0.74	0.39	-0.05
Spain	-0.38	-0.21	0.66	0.74	-0.61	0.26	0.84	0.74	0.48	-0.10	0.58	0.85
Finland	0.33	-0.27	-0.21	0.24	-0.32	0.00	0.37	-0.48	0.59	0.35	-0.11	0.58
France	0.68	-0.14	-0.69	0.54	-0.02	0.06	-0.67	-0.15	0.71	0.17	0.60	-0.07
Italy	0.25	0.24	-0.20	0.52	-0.08	0.25	-0.57	-0.54	0.19	0.05	-0.61	-0.70
Netherlands	0.16	-0.25	-0.19	0.30	0.21	-0.41	0.11	-0.40	0.50	0.62	-0.26	0.36
Sweden	-0.66	-0.24	0.47	0.34	-0.65	0.47	-0.38	0.46	0.35	-0.64	0.60	-0.23
Bulgaria	-0.68	0.24	0.86	-0.38	-0.68	-0.29	0.68	-0.46	0.26	0.86	0.97	-0.03
Hungary	0.64	0.40	-0.63	0.39	0.18	-0.27	-0.16	0.27	0.34	0.52	-0.78	-0.65
Lithuania	-0.90	-0.39	0.80	-0.07	-0.31	-0.79	0.54	0.19	0.23	0.63	-0.71	-0.23
Latvia	-0.61	-0.81	0.72	0.28	-0.78	-0.88	0.68	0.42	0.06	0.51	0.53	-0.63
Poland	-0.87	-0.32	0.60	0.42	-0.48	-0.69	0.27	0.04	0.21	0.58	-0.85	-0.86
Romania	-0.09	-0.08	0.77	-0.03	-0.52	-0.08	0.71	0.14	0.30	0.86	-0.56	-0.07
Slovakia	-0.01	-0.44	0.11	0.44	0.04	-0.55	0.15	-0.04	-0.04	0.44	0.13	0.46
Croatia	-0.43	-0.27	0.60	0.19	-0.16	-0.49	0.56	0.28	0.31	0.61	0.29	0.05

Source: Authors' calculation.

4 THE ECONOMETRIC MODEL AND ANALYSIS OF THE RESULTS

Taking into account high persistency in sovereign spreads, as government bond spread in current quarter depends among other things on the prior spread level, in the empirical part of the paper we employ a dynamic panel model. If static models were to be estimated and the underlying dynamics ignored, significant information might be lost, resulting in poor estimation results. When a dynamic model is estimated, even if we have no interest in the coefficient on the lagged dependent variable, dynamics are allowed for in the underlying processes, which might be essential for the recovery of consistent estimates of other parameters (Bond, 2002). The inclusion of lagged quantities, in addition to accounting for rigidities in adjustment, also lessens the problem of omitted variables.

4.1 DYNAMIC PANEL ANALYSIS

The linear dynamic model is specified as:

$$y_{i,t} = \gamma_1 y_{i,t-1} + \dots + \gamma_p y_{i,t-p} + \beta x_{i,t} + \alpha_i + \varepsilon_{i,t} \quad (1)$$

where $y_{i,t}$ is a dependent variable in time t , and $y_{i,t-1}$ lagged dependent variable, α_i is an individual fixed effect, $x_{i,t}$ is a vector of explanatory variables for unit i in

period t , and $\varepsilon_{i,t}$ is the disturbance term. It is assumed that $E\{\varepsilon_{i,t}\} = 0$ and $E\{\varepsilon_{i,t}, \varepsilon_{j,s}\} = \sigma^2$ if $i=j$ and $s=t$, and 0 otherwise. The objective is consistently to estimate γ_1 to γ_p and β when α_i is a fixed effect. Since $y_{i,t-1}$ is correlated with α_i OLS and random effect estimators are both inconsistent. It can be shown that the within estimator is also inconsistent and suffers from the so called Nickell bias which can be substantial and disappears only if $T \rightarrow \infty$.

If the model is transformed by first differencing to eliminate fixed effects we again introduce correlation between differenced lagged dependent variable and differenced error term so instrumental variable approach should be used.

The transformed model is then given by:

$$\Delta y_{i,t} = \gamma_1 \Delta y_{i,t-1} + \dots + \gamma_p \Delta y_{i,t-p} + \beta \Delta x_{i,t} + \Delta \varepsilon_{i,t} \quad (2)$$

where $\Delta y_{i,t} = y_{i,t} - y_{i,t-1}$.

In the case of the lagged dependent variable, valid instruments will be those which are correlated with $\Delta y_{i,t-1}$ and uncorrelated with $\Delta \varepsilon_{i,t}$. The Anderson-Hsiao estimator could be used but even though it is consistent, it is not asymptotically efficient. Arellano and Bond (1991) showed that the most appropriate framework for obtaining estimates in this context is the generalized method of moments (GMM). GMM estimation uses a different number of instruments for the lagged dependent variable (and other endogenous variables) for each period, depending on how many are available, which increases the efficiency of the GMM estimator.¹⁰

The Arellano-Bond estimator, employed in this paper, uses lagged levels of the endogenous variables as instruments. So, for example, if $t=3$ the instrument for $\Delta y_{i,t-2}$ would be $y_{i,t-1}$; if $t=4$ instrument for $\Delta y_{i,t-3}$ will be $y_{i,t-2}$ but also $y_{i,t-1}$, and so on. The Arellano-Bond estimator uses instrument matrix that takes the following form

$$Z_i = \begin{bmatrix} y_{i1} & 0 & 0 & \dots & 0 & \dots & 0 \\ 0 & y_{i1} & y_{i2} & \dots & 0 & \dots & 0 \\ \cdot & \cdot & \cdot & \dots & \cdot & \dots & \cdot \\ 0 & 0 & 0 & \dots & y_{i1} & \dots & y_{i,T-2} \end{bmatrix} \quad (3)$$

and then exploits the moment conditions $E[Z_i', \Delta \varepsilon_i] = 0$ for $i = 1, 2, \dots, N$. The asymptotically efficient GMM estimator based on this set of moment conditions minimises the criterion

$$J_N = \left(\frac{1}{N} \sum_{i=1}^N \Delta v_i' Z_i \right) W_N \left(\frac{1}{N} \sum_{i=1}^N Z_i' \Delta v_i \right) \quad (4)$$

¹⁰ The estimation may include other variables which are exogenous and therefore need not be instrumented.

In the paper we use a one-step estimator based upon an optimal weighting matrix in the presence of homoskedasticity, and robust standard errors. The weighting matrix in this context is

$$W_{1,N} = \left[\frac{1}{N} \sum_{i=1}^N (Z_i' H Z_i) \right]^{-1} \quad (5)$$

which does not depend on any estimated parameters.^{11,12}

If the explanatory variable x is endogenous, it is treated symmetrically with the lagged dependent variable $y_{i,t-1}$ (Bond, 2002).¹³

One has to keep in mind that if $T > 3$ the model is overidentified so the validity of instruments should be tested using the standard GMM Sargan test of overidentifying restrictions. Also, the assumption of no serial correlation in error term in the original equation has to be tested by assuming no second-order serial correlation in the residuals of the first differenced equation.

4.2 THE EMPIRICAL MODEL AND THE RESULTS

This section presents and comments on the estimation results of specified models obtained by employing econometric strategy outlined in the previous section. General model is given by the following equation

$$spread_{i,t} = \gamma_1 spread_{i,t-1} + \beta_1 credit_risk_{i,t} + \beta_2 risk_aversion_{i,t} + \beta_3 liquidity_{i,t} + \alpha_1 + \varepsilon_{i,t} \quad (6)$$

All model specifications use CBOE_VIX as an indicator of global risk aversion and our measure of liquidity described in section 3.1. Regarding credit risk, two basic specifications use only fiscal variables, namely, expected government budget balance (specification 1) and expected public debt (specification 3). We do not include fiscal balance and public debt in the same equation in order to avoid problem of collinearity. These two general specifications are then expanded by including projected GDP growth that is also expected to be an important sovereign spread determinant.¹⁴ Each model specification was estimated for three different time periods: the overall period; Q1 2004 – Q4 2011; the period before the onset of the crisis, Q1 2004 – Q4 2007; and the period during and after the crisis; Q1 2008 – Q4 2011 and for three different groups of countries (all countries, developed countries and emerging market countries). Tables 2 to 4 summarize the results of estimated models.

¹¹ Where H is $(t-2)$ square matrix with 2's on the main diagonal, -1's on the first off-diagonals and 0's elsewhere (Bond, 2002).

¹² Simulations show that asymptotic standard errors tend to be too small for two-step estimators.

¹³ Important to note is the fact that lagged levels will convey meaningful information on subsequent changes in the variable only if the variable is not close to a random walk, which was pointed out by Blundell and Bond (1998).

¹⁴ We also tried to estimate the model with expected current account balance as an additional credit risk indicator but that did not yield any meaningful results. For that reason these results are not shown in tables 2-4.

TABLE 2

Results of dynamic panel model estimation, all countries

Variables	04-11				04-07				08-11			
	Model specification				Model specification				Model specification			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Spread (t-1)	0.57***	0.65***	0.56***	0.62***	0.78***	0.77***	0.71***	0.71	0.64***	0.57***	0.65***	0.54***
Projected fiscal balance	-1.70***	-4.07***	-	-	-0.30	0.11	-	-	-5.08***	-3.46***	-	-
Projected public debt	-	-	1.09***	1.09***	-	-	0.87***	0.82***	-	-	1.31***	1.59***
Projected GDP growth	-	6.40***	-	4.37***	-	-1.95***	-	-0.62*	-	-5.70***	-	-9.29***
Risk aversion indicator-VIX	5.85***	5.63***	6.02***	5.65***	1.95***	1.95***	2.07***	2.06***	4.84***	4.67***	4.87***	4.58***
Liquidity indicator	-15.42	-44.48	-16.25	-59.79	-5.94***	-5.20***	-6.67**	-5.36*	-4.89	-35.31	-45.87	-54.84
Constant	-0.02	146.39	-43.13	195.77	12.02*	21.49**	-25.02	-28.87	-12.66	187.99	158.82	242.76
AR2 – probability values-H0: no autocorrelation	0.09	0.10	0.07	0.10	0.53	0.57	0.57	0.57	0.46	0.56	0.37	0.65

Notes: AR2 – second order autocorrelation; significance level – * 10%, ** 5%, *** 1%.

Source: Authors' calculation.

TABLE 3
Results of dynamic panel model estimation, developed countries

Variables	04-11				04-07				08-11			
	Model specification				Model specification				Model specification			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Spread (t-1)	1.22***	1.22***	1.25***	1.22***	1.14***	1.29***	1.26***	1.24***	1.23***	1.20***	1.22***	1.18***
Projected fiscal balance	4.16**	1.81	-	-	3.50	9.44	-	-	3.45**	0.17	-	-
Projected public debt	-	-	-0.57	-0.15	-	-	-1.19	-1.26	-	-	-0.18	0.16
Projected GDP growth	-	5.32**	-	6.99***	-	0.93	-	-1.52	-	18.19***	-	8.56***
Risk aversion indicator-VIX	0.94***	1.16***	0.89***	1.22***	0.47***	0.44***	0.36**	0.32**	1.07***	1.38***	1.16***	1.42***
Liquidity indicator	-6.77	-4.94	-7.31	-4.07	-17.11	-19.87*	-22.50**	-20.90	-16.90**	-9.49*	-18.50**	-8.51
Constant	53.94	18.74	89.75	13.08	177.51	205.65**	297.75	287.40**	148.29	49.76	162.86**	28.18
AR2 – probability values-H0: no autocorrelation	0.23	0.23	0.13	0.25	0.40	0.68	0.72	0.68	0.05	0.07	0.06	0.08

Notes: AR2 – second order autocorrelation; significance level – * 10%, ** 5%, *** 1%.

Source: Authors' calculation.

TABLE 4

Results of dynamic panel model estimation, emerging market countries

Variables	04-11				04-07				08-11			
	Model specification		Model specification		Model specification		Model specification		Model specification		Model specification	
	I	II	III	IV	I	II	III	IV	I	II	III	IV
Spread (t-1)	0.45***	0.54***	0.48***	0.49**	0.71***	0.68***	0.58***	0.59***	0.45***	0.55***	0.50***	0.50***
Projected fiscal balance	-10.88*	-13.76**	-	-	-3.70*	-2.80	-	-	-12.02*	-15.34**	-	-
Projected public debt	-	-	2.73*	2.80*	-	-	2.01***	1.66**	-	-	3.47*	3.52*
Projected GDP growth	-	6.55	-	0.61	-	-6.87***	-	-3.49	-	7.15	-	-0.06
Risk aversion indicator-VIX	8.72***	8.81***	8.83***	8.83***	2.77***	2.91***	2.90***	2.95***	9.59***	9.71***	10.07***	10.08***
Liquidity indicator	-65.47	-58.73	-66.83	-65.02	-13.32	-8.51	-14.01	-12.67	55.62	51.40	54.16	56.90
Constant	-73.70***	-129.04**	-142.88**	-151.25**	-25.74**	12.02	-77.38***	-47.58	-182.49***	-235.37***	-296.00***	-300.64**
AR2 - probability values-H0: no autocorrelation	0.20	0.23	0.20	0.20	0.61	0.69	0.82	0.87	0.14	0.17	0.15	0.15

Notes: AR2 – second order autocorrelation; significance level – * 10%, ** 5%, *** 1%.

Source: Authors' calculation.

The first lag of the dependent variable is highly significant in all three observed periods and in all three groups of countries, justifying the usage of a dynamic panel model. Also, the results suggest there is no second order autocorrelation in the first-difference version of different model specifications at the usual significance level, indicating they are well specified.

Table 2 shows panel results when all countries are included in our sample. If the whole period is considered, results indicate that fiscal variables and general risk aversion played an important role, with the latter indicator having the largest influence on sovereign spreads dynamics. The results also suggest that projected fiscal balance has larger impact on spreads than public debt, which is in line with the results presented in empirical literature. For projected GDP growth we get a counterintuitive result. Estimation results show that it is significant but it has a wrong sign.

When the sample is split in two periods; Q1 2004 – Q4 2007 and Q1 2008 – Q4 2011, it seems that results from full sample panel estimation are greatly determined by the reaction of the spreads in the crisis period. Namely, before the crisis, projected fiscal balance is insignificant, while public debt and projected GDP seem to be the main indicators of country credit risk, but relatively low coefficients next to them indicate that they did not have an important role in determining the spreads. It could be concluded that liquidity risk and general risk aversion were the most important drivers of sovereign spread dynamics.

After the onset of the financial crisis all credit risk indicators are significant and have the expected sign while the liquidity risk indicator lost significance. Apart from that, their influence on spreads is much larger than before, indicating that in the crisis period investors started to pay more attention to country-specific macroeconomic and fiscal developments and to differentiate more between the countries.

However, the significance of credit risk indicators seems to be due to the reaction of spreads to the macroeconomic and fiscal factors of emerging market countries; the results for developed countries (displayed in table 3) show that their credit risk indicators are either insignificant or have counterintuitive signs in all three different periods. It seems that risk aversion and liquidity risk were main determinants of spread dynamics for developed countries before and after the onset of the crisis, although the liquidity indicator lost significance in some model specifications. These results are somewhat contrary to those presented in for example Barrios et al. (2009), where the authors concluded that fiscal variables together with market liquidity and general risk aversion played important roles in determining the spreads of developed EU countries in the recent period. An answer to these different estimations could lie in the construction of fiscal variables. Namely, explanatory variables in Barrios et al. (2009) are expressed relative to

Germany, while we use original data. So it is possible that when it comes to developed EU countries, investors compare country-specific factors with those of Germany. In that case we could expect to see an increase in sovereign spreads if, let us say, the expected public debt for a certain country increases more than for Germany, and if it increases less, spreads should fall despite there being a deterioration in fiscal indicators.

On the other hand, the estimation results presented in table 4 suggest that credit risk factors are very important in determining the bond spreads of emerging markets countries. Projected fiscal balance and projected public debt are both significant and with the right sign before and after of the onset of the financial crisis in most model specifications. Projected fiscal balance only loses its significance when projected GDP growth is included in the Model 2 in the pre-crisis period, but then projected GDP growth is significant and with the expected sign. Also, coefficients next to fiscal variables are much higher than those obtained for the whole sample of countries. Table 4 shows that the relatively high coefficient next to fiscal balance in the whole sample period is primarily the consequence of a several-times-larger reaction of spreads to fiscal balance in the period after the onset of financial crisis.

The risk aversion component for emerging market countries is highly significant in all three different periods and its impact is even higher in the crisis period. Results also suggest that it has a larger influence on emerging market countries than on developed countries, especially in the crisis period. On the other hand, the liquidity risk seems to have no influence on movements in sovereign spreads of emerging market countries before and after the onset of crisis.

5 CONCLUSION

The crisis has changed the world we live in, or at least our perception of it. After they reached historically low levels in the pre-crisis period, sovereign spreads exploded in late 2008 and early 2009. For some countries the increase was so dramatic that it pushed them into a sovereign debt crisis. By analyzing data for 17 European countries with a special focus on fiscal variables this paper tried to answer what the main drivers of such developments were. Did the macroeconomic and fiscal situations really become so much worse? Or did investors simply start to pay more attention to previously ignored factors?

Simple descriptive data analysis shows that macroeconomic and fiscal situations really did worsen significantly with the onset of the crisis. After several years of robust growth and declining fiscal imbalances Europe was hit by the worst recession in more than sixty years. Fiscal deficits reached a level not seen in years and public debt figures skyrocketed in some countries. At the same time, growth prospects for many countries became much weaker. Such developments have an adverse effect on government solvency so it is reasonable to expect that spreads

should be affected. In addition, it seems that investors started to pay much more attention to factors neglected during times of prosperity, such as fiscal sustainability. Even in the period 2004-2007, macroeconomic and fiscal developments were not homogenous, but this has not been reflected in the different spread levels among countries, as their differences were negligible.

Econometric analysis was conducted using dynamic panel data model and the Arellano-Bond estimator which is in our opinion the most appropriate for the purpose. The results for the entire sample (all countries and the whole period) confirm our prior belief and are also in line with the empirical literature. Both general risk aversion and fiscal variables as indicators of credit risk are proven to be statistically significant determinants of sovereign yield spreads. The results are robust to the use of different fiscal indicator, that is, fiscal balance vs. public debt. The liquidity indicator, on the other hand, statistically does not differ from zero, even though it has the expected sign.

All model specifications offer some interesting insights when estimated on two sub-periods (2004-2007, 2008-2011). It seems that spreads reacted much more strongly to changes in overall market risk aversion after the onset of the crises. The initial shock triggering the crisis (Lehman Brothers) never died away completely, and many subsequent events resulted in spreads remaining on much higher level than before the crisis (almost on 100 percent higher level regardless of the indicator used to measure general risk aversion). In such an environment these results are in line with expectations. Also as expected, credit risk indicators were shown to be much more important determinant of spreads during 2008-2011 period. The results confirm that markets like both saving and growth. So if the expected growth went up or the fiscal policy were projected to become more prudent, the markets were demanding lower spreads.

Estimating the model separately for developed and emerging market countries suggests that the aforementioned results are mostly driven by the latter. It seems that the general risk aversion is the most important determinant of developed countries' bond spreads and the credit risk indicators were either statistically insignificant or had a wrong sign. One possible explanation would be that investors do not react to changes in macroeconomic or fiscal situation, but to the changes compared to a "referent" country, in this case Germany. On the other hand, the crisis changed the way markets react to expected macroeconomic and fiscal developments in emerging market countries in the sample. Coefficients next to fiscal and general risk aversion indicators are much higher in 2008-2011 period than before. Such results would suggest that emerging market countries came under the magnifying glass of investors while developed countries got into trouble a little bit later.

At the end, one could conclude that countries should only partly blame themselves for increased borrowing costs. Even though there is not much a single country can do to change market sentiment, evidence suggest there is a certain manoeuvring space for the domestic policy makers to contribute with their actions to a decline of their borrowing cost, and consequently to support the long-term sustainability of public finances. This is an important lesson for policy makers. There is, however, a lesson for financial markets as well, as their role in adequate risk pricing should be played with much greater caution. By neglecting important signs of unsustainable imbalances and signalling that countries are in “a good shape” they failed to act as a corrective of unsound policies. The future will show whether these lessons have been learned.

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The effect of political institutions on the size of government spending in European Union member states and Croatia

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Abstract

This paper presents an overview of theoretical and empirical research on the interaction between political institutions and economic variables. Using the dynamic panel model, the paper also investigates the indirect effects of electoral systems on the size of general government spending. The analysis is performed on a panel dataset of 26 countries (25 member states of the European Union and Croatia) for the period between 1995 and 2010. The results show that government fragmentation and political stability affect the dynamics of budgetary expenditures in line with theoretical assumptions. Regarding the implications of this research for Croatia, it has been shown that a higher degree of government fragmentation leads to an increase in government spending which is a significant result since Croatia has generally had some form of coalition government.

Keywords: political institutions, fiscal policy, electoral systems, government fragmentation, political competition, political stability

1 INTRODUCTION

The correlation between political institutions and economic development is one of the most interesting research areas at the interface between economics and political science (Persson and Tabellini, 2006). Specifically, modern politico-economic models view government as an endogenous factor in the political and economic system, which is in contrast with the conventional normative approach that sees the policy maker as a “benevolent social planner” whose only objective is to maximize social welfare (Snowdon and Vane, 2005:30). Within these models, economic policies are not designed independently of the influence of various aspects of political institutions. Government, responsible for the choice and implementation of economic policy, is at the centre of the interaction between political and economic factors. But the behaviour of government is shaped by the various institutional constraints that comprise the political system (Snowdon and Vane, 2005:521). Moreover, from the aspect of political economy, economic policy is fraught with conflicts of interest (Roberts Clark, Golder and Golder Nadenichek, 2009). These conflicts inevitably occur since societies are made of individuals and groups with specific values and interests as the result of their different occupations, sources of income, ideologies and so on (Persson and Tabellini, 2004b). In this context, Persson and Tabellini (2000:207) identify three fundamental conflicts of interest. First, policymakers can exploit their political power and use public funds at the expense of voters. Second, voters come into conflict over the allocation of redistributive transfers; and finally, the politicians come into conflict over the distribution of rents among themselves. Political institutions, which differ in many dimensions, play the key role in the resolution of these conflicts. The aim of this paper is to determine the dimensions of political institutions that directly and/or indirectly affect the size of government spending. Specifically, the paper empirically investigates whether a higher degree of government fragmentation, political competition and political stability affect government spending dynamics.

2 THE EFFECT OF ELECTORAL SYSTEMS ON FISCAL POLICY

OUTCOMES: THEORETICAL FRAMEWORK

The literature on the effects of political institutions on fiscal policy recorded significant growth in the last twenty years (for example, Milesi-Ferretti, Perotti and Rostagno, 2002; Persson and Tabellini, 2000, 2003, 2004; Persson, 2002; Persson, Roland and Tabellini, 2003; Voigt, 2009; Gregorini and Longoni, 2010; Acemoglu, 2005; Blume et al., 2007; Hallerberg and von Hagen, 1997), which has significantly improved the understanding of politico-economic relations in society. In most of these studies, there are two categories of political institutions under review: electoral systems and forms of government. Although there is no universal consensus regarding their effects on fiscal policy, it is generally considered in the literature that the parliamentary form of government and proportional electoral system are characterized by higher government spending and taxes, higher welfare states, higher budget deficits and public debt. On the other hand, the presidential form of government and a majoritarian (plurality) electoral system are characterized by lower government spending and taxes, lower welfare states and more balanced budget. Thus, there are good reasons to restrict the research to fiscal policy outcomes. Moreover, numerous authors in their analyses use the size and structure of government spending, tax revenues, budget balance and public debt as relevant variables.

The objective of this paper is to investigate electoral rules for the election of political candidates and their potential effects on fiscal policy outcomes. These rules differ from the aspect of three main characteristics: district magnitude, electoral formula and ballot structure (Persson and Tabellini, 2004b). First, district magnitude determines the number of seats (legislators) in the district, distinguishing between single- and multi-member districts. This dimension of electoral rules affects both the degree of proportionality and representation (of relevant social groups by politicians) of elections¹ and is considered the most effective and highly manipulated political dimension of the electoral system (Kasapović, 2003:152). Generally, larger districts increase electoral competition encouraging politicians to seek support from broader coalitions of voters, which generates larger and broader fiscal programs. Smaller districts, on the other side, foster attention to pivotal geographical constituencies inducing a larger number of specific programs and benefits (Klašnja, 2008). Next, the electoral formula is considered to be the most important dimension of electoral rules. It encompasses rules and methods for translating votes into seats², distinguishing between plurality and proportional electoral rule (Persson and Tabellini, 2004b). Politicians do not need to take into account

¹ Larger districts are more proportional and representative; with a larger district the number of candidates in the political process increases (who can produce lower equilibrium rents) but also voters can punish corrupt parties with lower ideological costs (Persson, 2002).

² An electoral formula determines the minimum number of votes needed to win the elections. The majoritarian electoral system is based on plurality rule (the electoral winner is determined by relative or absolute majority of the votes) while the proportional electoral system is based on the principle of proportional representation (PR) of the electorate (distribution of seats proportional to the number of obtained votes) (Kasapović, 2003).

the preferences and interests of all voters, but primarily need to please those that will help them to win the elections (Klašnja, 2008). Since under plurality rule the share of total votes needed is smaller than under proportional rule, government spending will be directed towards smaller and geographically more targeted segments of voters³ which generates preferences for instruments such as local public goods, pork-barrel spending, etc. (Persson and Tabellini, 2003; Milesi-Feretti, Perrotti and Rostagno, 2002). On the other hand, under proportional rule, politicians try to internalize benefits for larger segments of the population which results in higher government spending based on universal transfers and programs that benefit larger groups of population (Persson and Tabellini, 2003). The third dimension of electoral rules, ballot structure, determines how voters vote and cast their preferences among individual political candidates and party lists. This dimension has an effect on fiscal policy through attribution to and sensitivity of votes to incumbents' performance (Klašnja, 2008). In general, plurality (proportional) electoral system is based on individual candidates (party lists) (Voigt, 2009). Specifically, under the proportional system based on party lists, due to the lower political accountability, one can expect problems of free riders, rent-seeking and increased corruption (Persson and Tabellini, 2000; 2003). All of this can then result in excessive spending of policy-makers and the consequent pressure on tax increases. Although the described dimensions of political institutions are theoretically distinct, they are usually correlated across countries which led to a classification into two main electoral systems: majoritarian (plurality) and proportional (Persson and Tabellini, 2004b). Generally, countries using plurality rule have a minimum district magnitude (single-member districts) and allow voting for individual candidates, while countries using proportional rule have larger districts and rely on voting for party lists (Voigt, 2009). Hence, there is a trade-off between two electoral systems, neither of which delivers superior outcomes. Proportional systems are more representative but induce more spending, rent-seeking activities and redistribution in favour of the majority. On the other side, majoritarian systems are characterized with redistribution in favour of minorities, lower spending and higher political accountability (Klašnja, 2008).

Electoral systems can also have an indirect impact on fiscal policy through their effects on the structure of political parties, type of government, political competition as well as political stability (see Besley, Persson and Sturm, 2010; Persson and Tabellini, 2006; Persson, Roland and Tabellini, 2003; Gregorini and Longoni, 2010; Padovano and Venturi, 2001). For example, the proportional electoral system is associated with a more fragmented party system with frequent coalition governments while majoritarian electoral systems often result in single-party government. Therefore, it would be reasonable to expect that these effects are also reflected in the economic policies implemented under different types of party systems and governments. In general, with increasing government fragmentation, one can expect higher spending targeted towards more heterogeneous population

³ In other words, politicians will be more focused on swing voters.

groups (Gregorini and Longoni, 2010). A more detailed description of the correlation between these dimensions of political institutions and government spending is given in the section dealing with the econometric analysis (section 4) since these categories of political institutions are included in the model.

3 EMPIRICAL LITERATURE REVIEW AND METHODOLOGICAL ISSUES

Although from the empirical point of view there still remain many challenges, existing studies have generally confirmed the significance of political institutions for economic policy making. Persson and Tabellini (2003) conducted a study on a sample of 85 countries for the 1990s and showed that the total spending of the central government is on average 4-5% of GDP higher in a proportional than in a majoritarian electoral system. Their results also showed that the reform from proportional to majoritarian electoral system leads to a decrease in social security expenditures by an average of 2-3% of GDP as well as to a decrease in the budget deficit by 1-2% of GDP. Moreover, Milesi-Ferretti, Perotti and Rostagno (2002) investigated the impact of electoral systems on the size and composition of government spending on a sample of 20 countries of the Organization for Economic Cooperation and Development (OECD) and 20 countries of Latin America. Their results also imply that proportional electoral systems (in comparison to majoritarian systems) are characterized by higher total government spending and higher transfer payments (opposed to the local public goods). Blume et al. (2007), based on the analysis of Persson and Tabellini (2003) and by increasing the number of countries in the sample to 116, show that central government spending is on average 7% lower in a majoritarian than in a proportional electoral system. However, the authors point out that the district size and the proportion of individually elected candidates are more important factors than electoral system per se. Persson and Tabellini (2006:729), discussing both the direct and indirect effects, point out that electoral systems affect government spending only indirectly through the structure and type of government. In this line of research, Gregorini and Longoni (2010) performed an analysis controlling for the effects of government fragmentation (i.e. distribution of seats within a particular government) on spending. As pointed out by the authors, there are countries with proportional electoral systems and low fragmentation (and vice versa), which makes it interesting to analyse the differences between the degree of government fragmentation (even within the two categories of electoral systems) and their impact on policy makers' preferences for public spending. They argue that with a higher degree of fragmentation, government spending increases and focuses on more heterogeneous groups. Roubini and Sachs (1989) also showed that more fragmented governments are characterized by higher deficit and public debt (in OECD countries), primarily due to their tendency to excessive spending because of different interests and constituencies, veto powers over budget or weak enforcement mechanisms for binding commitments among coalition partners.

On a sample of 50 U.S. state governments, Poterba (1994) confirms that fiscal institutions and political factors affect deficit dynamics (in the short run). States in which one party controls both the governorship and the state house are more likely to react quickly to unexpected deficits compared to those in which control is divided between parties. Hallerberg and von Hagen (1997) analysed the impact of the electoral systems and the number of parties on fiscal policy outcomes and concluded that the process of delegation of authority to the finance minister or the commitment to negotiated fiscal contracts may have a significant impact on the budget deficit growth, arguing that such institutions can be particularly effective in keeping deficits low in countries with some form of political instability. Moreover, Hallerberg and von Hagen (1997) suggest that countries that want to reduce their deficits should choose one of these budgetary institutions based on a form of government, either a single-party majority government or a multi-party coalition government (whereby single-party governments are more suitable for delegation, while multi-party governments rely more on fiscal contracts). In addition, the authors point out that the comparison of the various systems and solutions applied indicates that (under certain conditions) the role of a strong finance minister can be extended to multi-party governments. Alesina et al. (1999) also emphasize the significance of cross-country variation in fiscal performance, explaining these differences by focusing upon the procedures which lead to the formulation, approval and implementation of the budget. Analysing the impact of budgetary procedures on a sample of 20 Latin American and Caribbean countries (between 1980 and 1992), the authors conclude that more transparent and hierarchical procedures⁴ lead to lower deficit levels.

While some results are consistent with theoretical predictions, others require more detailed analysis. Moreover, there is a specific degree of criticism of applied econometric tools, which are highly sensitive to sample size, time period used as well as to the selection of variables. From the aspect of countries included in the analysis, criticisms usually refer to the government ideology. It is generally assumed that proportional electoral systems lead to more redistribution by facilitating the election of left-wing parties which represent the interests of low-income voters, while right-wing governments representing the interests of high-income voters are associated with plurality electoral system (for details see Roberts Clark, Golder and Golder Nadenichek, 2009:713-715). Therefore, according to the authors, this argument could illustrate why the expenditures are higher under the proportional system. In a situation in which the electoral system is determined on the basis of policies implemented by policymakers, this could account for the correlation with ideology: under the domination of left-wing voters one would choose a proportional electoral system, while the plurality system would be chosen under the domination of right-wing ideology (Persson and Tabellini, 2004b). However, the authors also argue that empirical results cast doubt on this criticism

⁴ Alesina and Perotti (1999) stressed that hierarchical budgetary procedures are analogous to majoritarian electoral systems.

since even if electoral systems affect policy through the ideology of the government (and not e.g. through the number of parties in the government) then the electoral rule itself would not be a valid instrument for the incidence of coalition governments in a regression on government expenditure which is in contrast with obtained research results. Acemoglu (2005) presents a comprehensive critique of various estimation methods and variable selection, especially from the aspect of the application of the ordinary least squares method (OLS) which relies on the exogeneity of political institutions. The author points out that although the OLS results uncover interesting patterns, they do not completely identify causal effects since political institutions are determined by various social factors that are not fully controlled for in the models. Therefore, he suggests an alternative approach within which political institutions should be endogenous, i.e. determined by the same factors that have a direct effect on economic policy outcomes⁵.

Furthermore, while various studies include in their samples a large number of countries that differ in numerous aspects, it is also interesting to focus research on more homogeneous group of countries. Finally, since many findings are still preliminary and the subject of continuous debates, the research area on the impact of political institutions has much potential for further analysis. Because existing strategies for comparative research tend to ignore the relationship among electoral systems, party structures, the government formation and fiscal policy making, research needs to focus more on better understanding of the detailed mechanisms regarding the influence of political institutions on economic policy (as suggested by Persson and Tabellini, 2003).

The literature review revealed a process of decision making that differs from the ideal normative model. The government does not necessarily operate in the public interest but serves the interests of various agents (i.e. state capture) and leads to different effects on various social groups (Acocella, 2005; Hellman and Schanckerman, 2000). Therefore, discussions regarding electoral system reforms have been present since the 1990s in both countries characterized as “new democracies” and in developed democracies such as the United Kingdom. In addition, some reforms have been implemented e.g. in New Zealand, Japan and Italy (Persson and Tabellini, 2004b). However, it still remains an open question which combination of different dimensions of political institutions is superior. In this context, the contribution of economists to the discussion on the future of the political institutions at the EU level is relatively slight (Voigt, 2009).

4 EMPIRICAL ANALYSIS

Analysis of the effects of fiscal and hence political institutions was stimulated by the need to control excessive spending and deficits in OECD and developing countries; as well as by the European Union’s desire to design a set of rules to

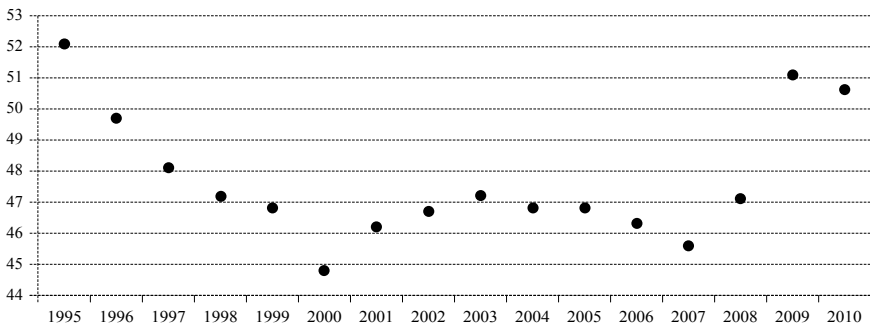
⁵ Rational agents should understand and have preferences over both implications of economic policies and various political institutions (Acemoglu, 2005).

govern national fiscal policies in its member states (von Hagen, 2006). The significance of political institutions for economic policy making is reflected through their governing of decisions regarding public finances, which can result in mitigation of adverse effects of the principal-agent and common-pool problem (for details see von Hagen, 2006). Furthermore, Lohman (2006:523) highlights two important issues. First, that economic policy deviates from the normative aspects of economic theory and second, that economic performance changes over time and differs across countries to a degree that economic factors cannot explain. The author also raises the question whether political factors – collective action and political institutions – can explain these issues.

Therefore, the goal of this section is to analyse empirically theoretical predictions about the impact of political institutions on fiscal policy outcomes in the EU and Croatia. The research encompasses the analysis of the indirect impact of electoral systems on government spending. Special weight in this paper is given to a panel data analysis for the period between 1995 and 2010 on a sample of 25 EU member states⁶ and Croatia. Figure 1 shows the average size of government spending in the EU-27 (measured by the share of total general government spending in GDP). We can see that there was not much variation until 2008 when a significant increase was recorded. On the other side, figure 2 shows that cross-country expenditure (average values for the period between 1995 and 2010) ranges from 35% to 55% of GDP. Based on these trends, it appears that the size of the state varies among countries, and slightly less over time.

FIGURE 1

The share of total general government spending in GDP (EU-27 average), 1995-2010

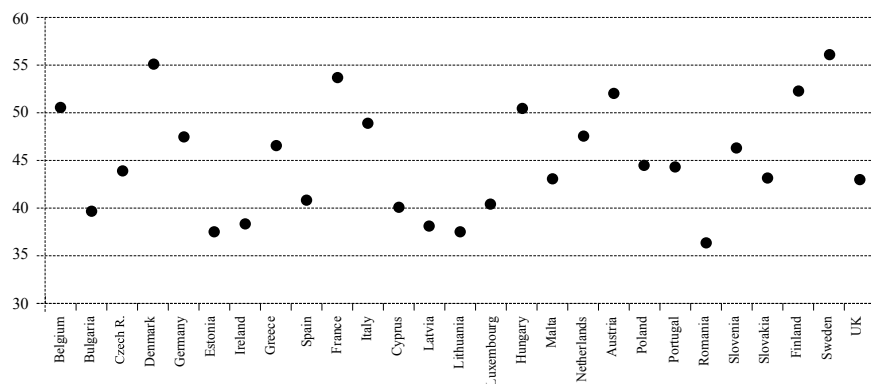


Source: Eurostat.

⁶ Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, France, Finland, Greece, Ireland, Italy, Latvia, Lithuania, Hungary, Netherlands, Germany, Poland, Portugal, Romania, Slovenia, Slovakia, Spain, Sweden, UK.

FIGURE 2

The share of total general government spending in GDP (cross-country average for 1995-2010 period)



Source: Eurostat.

Since with the process of EU integration member states commit themselves to follow certain rules on their policies, which results in the implementation of similar economic policies at national levels, the main question then is what caused the observed variation. One of the potential answers is that political institutions have a significant impact on economic policy making. This is supported by the research of Hallerberg, Strauch and von Hagen (2007) who argue that although all EU member states are faced with the same fiscal framework, there are significant variations in their budgetary institutions at national levels, stemming from the specific characteristics of their political institutions. In Croatia, the issues of political institutions were partially the research subject of Rubil and Švaljek (2010) who, based on an analysis of the Croatian political system, argue for the use of fiscal rules. However, according to the present writers' knowledge, there are few detailed papers on the correlation between political institutions and fiscal policy outcomes.

From the aspect of political institutions that are usually analysed in the literature, all EU countries except France and UK have a proportional electoral system⁷. Therefore, we analyse the source of variation in government expenditure from the aspect of specific dimensions within the electoral system. Thus, the contribution of this paper to the literature is reflected in analysis of detailed mechanisms, i.e. indirect effects of electoral systems (through selected dimensions of government fragmentation, political competition and political stability) on the size of government. Based on the recommendations of Aidt and Eterovic (2011), analysis is performed on a more homogenous group of countries (so far, most research has conducted analysis of a sample of a large number of developed and developing

⁷ From the aspect of the form of government, all of the member states except Cyprus, Poland and Lithuania have a parliamentary system.

countries that differ in their economic, geographic, cultural and social characteristics).

4.1 DESCRIPTION OF THE MODEL AND VARIABLES

Econometric analysis is performed using the dynamic panel model⁸ based on the Arellano-Bond (1991) generalised method of moments (GMM). Compared to static models, dynamic panel models are often used in economics since even though the coefficient on the lagged dependent variable is not of direct interest, allowing for the dynamics may be crucial for recovering consistent estimates of other parameters (Bond, 2002). Since the dataset used in this paper is characterized by a smaller number of periods and large number of observation units, the Arellano-Bond estimator is used. This estimator is widely used for the analysis of linear relationship with the dynamic dependent variable (i.e. variable dependent on its own past values) and in a situation in which the independent variables are not strictly exogenous. In addition, the estimator takes into account the specificity of each observed unit and allows for heteroskedasticity and autocorrelation within the unit of observation, but not across them (Roodman, 2006). The Arellano-Bond estimation begins by transforming all regressors, usually by differencing, and uses the generalised method of moments (Hansen, 1982). Furthermore, since data for all countries and periods of interest are not available, an unbalanced⁹ panel model is used. The model is described by the following equation:

$$y_{it} = \mu + \delta y_{i,t-1} + \beta_i x_{itK} + v_i + u_{it}, \text{ and } i = 1, \dots, N, t = 1, \dots, T, \quad (1)$$

where N is the number of units of observation, T is the number of periods, y_{it} stands for the value of the dependent variable (total general government expenditures for 25 EU member states and Croatia, expressed as a share in GDP – *exp*) i in the period t , the parameter μ is the constant, δ is the scalar, $y_{i,t-1}$ is the one-period-lagged (one year) dependent variable (for the same country), x_{it1}, \dots, x_{itK} are the K of independent variables (*herfgov*, *polityIV*, *gdp_gr*, *pop* and *stabs*) for the member state i during the period t (i.e. x'_{it} is $1 \times K$ and β is $K \times 1$), v_i is the fixed element or random error for the unit of observation, and u_{it} the error term. It is assumed that all variables x_{it} are strictly exogenous and uncorrelated with any u_{it} ¹⁰.

⁸ In general, given the characteristics of the panel data, we can distinguish between static (combined or pooled models, fixed effect models and random effect models) and dynamic models. The static panel models are robust in terms of the correlation within the unit of observation, but the choice of the panel model is not simple since the correlation between observations within a single unit of observation must be constant regardless of time period across these observations (Škrabić, 2009). This may impose some limitations since economic variables usually feature a correlation between the current value of the variable and its value from the previous period, and if this correlation is ignored, the estimated parameters of the model will be consistent but inefficient with biased standard errors (Škrabić, 2009).

⁹ In balanced panel data models all units have values in all periods.

¹⁰ However, the assumption of strict exogeneity is often replaced by the assumption of predetermined, which means that the current and lagged values of each independent variable are uncorrelated with the current values of error terms (Škrabić, 2009).

Following the research of Gregorini and Longoni (2010), government fragmentation is proxied by the Herfindahl index¹¹ (*herfgov*) which represents a measure of concentration of ruling coalition. In the case of single-party government, the index equals 1 while in the case of a coalition government, it takes a value between 0 and 1. Thus, the higher the number of parties in coalition government the lower is the value of the Herfindahl index. On the other hand, the index will be higher with the dominant party in the coalition government. From the aspect of the effect on government expenditures, a higher fragmentation (lower index value) leads to an increase in the expenditures. The higher the number of parties in the coalition government, the higher the probability of a common-pool problem since each political party will try to target the interests of their constituency (Persson and Tabellini, 2003). That is, an increase in the value of Herfindahl index (i.e. the decrease of the number of parties in the coalition government) results in the decrease of government spending. Therefore, we expect a negative sign of the coefficient with this variable. Furthermore, although *polityIV* is generally interpreted as a measure of democracy, according to some authors this variable can also be interpreted as a measure of the degree of political competition among political parties, interest groups and other organized factions who compete in order to gain political power within a defined political structure (for more details see Aidt and Eterovic, 2011). From this aspect, a higher degree of political competition can be associated with more efficient government (ruling party has incentives for better performance in order to be re-elected) so in this case a negative sign of the coefficient is expected (Aidt and Eterovic, 2011; Besley, Persson and Sturm, 2010)¹². However, in a case in which the probability of a re-election is low, politicians can behave opportunistically and one can expect an increase in government expenditure in order to “buy” the votes needed to win the elections. Finally, the variable *stabs* is used as a variable for political stability and it is defined as the share of veto players that drop out of the government in any given year (Beck et al., 2001). The sign of the coefficient on the variable *stabs* can be both positive and negative: while higher stability is in general characterised by lower government expenditure (Devereux and Wen, 1998), it could also lead to excessive spending and higher debt since it could make it easier for government to use public finances strategically in order to keep the parliamentary majority (Tabellini and Alesina, 1990; Padovano and Venturi, 2001). We also use the following control variables: *gdp_gr* and *pop*. Variable *gdp_gr* represents the value of the real GDP growth rate and it is used as a proxy for general economic development and the impact of business cycles on expenditures. The expected sign of this variable can be positive or negative, depending on the discretionary fiscal policy. Furthermore, the variable *pop* indicates the proportion of the population aged 60 years and over, and as the aging population puts additional pressure on the increase in total expenditures (primarily through spending on pensions and health care) we expect a positive sign of the

¹¹ Generally, the measure is calculated as the sum of the squared seat shares of all parties in the government and shows how the seats are distributed within the government coalition.

¹² Additional reasons for expected negative coefficient with the variable *polityIV* are listed in Aidt and Eterovic (2011).

coefficient with this variable. The lagged value of a dependent variable (one-period lag) will be used as an instrumental variable. Furthermore, the validity of the instruments selected for the evaluation of the model is tested using the Sargan test¹³. Besides the Sargan test, testing the autocorrelation in residuals is also performed using the m_1 and m_2 tests¹⁴. Table 1 lists the variables used in the analysis as well as data sources.

TABLE 1
Variables and data sources

Variable	Description	Source
<i>exp</i>	Total general government expenditure (in % of GDP)	Eurostat, Croatian National Bank
<i>herfgov</i>	Herfindahl index	Database of Political Institutions (DPI)
<i>polityIV</i>	Political competition	Polity IV Project
<i>bdp_gr</i>	Real GDP growth rate	Eurostat
<i>pop</i>	Share of population aged 60 years and over	Eurostat
<i>stabs</i>	Political stability	Database of Political Institutions

Source: Authors' compilation.

4.2 RESULTS AND IMPLICATIONS FOR CROATIA

Table 2 shows the results of the estimated impact of the selected variables on budgetary expenditures in the EU member states and Croatia as well as the diagnostic tests of dynamic panel data analysis. The tests for first- and second-order autocorrelation yield the expected results, i.e. the tests do not reject the absence of second-order autocorrelation¹⁵ among differenced residuals. Moreover, the Sargan test for over-identification restrictions does not reject the null hypothesis of the absence of correlation between the residuals and the instrumental variables. The lagged dependent variable is statistically significant and has a positive sign. Furthermore, the results show that the variables *herfgov*, *bdp_gr*, *pop* and *stabs* are statistically significant, with the expected signs of estimated coefficients. Therefore, general government spending in EU member states and Croatia is influenced by government fragmentation and political stability; higher government fragmentation (a lower Herfindahl index) leads to an increase in government expenditures.

¹³ The Sargan test for over-identification of the restrictions in the statistical model (i.e. the validity of instrumental variables) is based on the assumption that the residuals should be uncorrelated with a set of exogenous variables if the instruments are exogenous. This test has the null hypothesis that the instrumental variables are uncorrelated with the set of residuals.

¹⁴ The null hypothesis of the m_1 test assumes the absence of a first-order autocorrelation between differenced residuals, and the null hypothesis of the m_2 test assumes the absence of a second-order autocorrelation between differenced residuals.

¹⁵ Considering that the first order autocorrelation is usually expected among the residuals its presence is often neglected. On the other side, the absence of second-order autocorrelation does not refer to problems of model specification, i.e. does not imply that some of the moment conditions are invalid (Huang, 2006; Škrabić, 2009). Furthermore, despite the existence of the first order autocorrelation but with no second-order autocorrelation, GMM estimates are consistent (Arellano and Bond, 1991).

Furthermore, political stability (decrease in the variable *stabs*) is positively associated with government spending. Control variables – GDP growth rate and aging population – are also significant in the model. Finally, the degree of political competition (*polityIV*) and the constant term are not statistically significant.

TABLE 2

Results of the dynamic panel model

Variable	Results
<i>C</i>	-0.093 (0.283)
exp_{t-1}	0.678 (0.000*)
<i>herfgov</i>	-2.784 (0.010*)
<i>polityIV</i>	-0.051 (0.886)
<i>gdp_gr</i>	-0.329 (0.000*)
<i>pop</i>	0.658 (0.085***)
<i>stabs</i>	-1.073 (0.007*)
Number of observations	355
Number of countries	26
Sargan test (p-value)	0.5241
Autocorrelation of first order (p-value)	0.0000
Autocorrelation of second order (p-value)	0.8278

Note: *, **, *** indicate statistical significance at levels of 1%, 5% and 10%; p-values are in brackets.

Source: Authors' calculation.

Results are consistent with previously described theoretical and empirical studies (e.g. Persson and Tabellini, 2006; Persson, Roland and Tabellini, 2003; Gregorini and Longoni, 2010; Hallerberg and von Hagen, 1997, etc.). However, the key issue is the normative implications of the research. Electoral systems (through defining the “rules of the game”) are supposed to establish a balance between the representation and accountability regarded as two measures of the performance of democratic institutions (Persson and Tabellini, 2006). The dimension of electoral systems that attracts the most attention is proportionality – proportional systems lead to an increase in political representation in combination with adverse fiscal policy outcomes so the main question is whether (and how) this trade-off can be mitigated (Fabrizio and Mody, 2007). Since electoral systems are operating in the complex framework of historical, social, cultural, institutional and political factors, a historical and empirical approach is essential to normative issues (Nohlen, 1992). Finally, the design of any potential electoral reform includes two key steps. The first step is based on the scientific and political evaluation of the functionality of the existing electoral system, while the second step encompasses defining the objectives of electoral politics (Kasapović, 2003).

Therefore, the results obtained in this study can serve as a basis for the analysis of the practical role of political institutions in economic policy making and can have

significant implications for Croatia due to the continuing debates of whether Croatia needs yet another reform of the electoral system. In 1990s Croatia changed all of the main models of the electoral system: absolute majoritarian system (1990), mixed system with an equal weight of majority and party list seats (1992), mixed system with the prevailing share of list seats (1995) and proportional electoral system with multi-member districts and closed (blocked) lists (2000) (Kasapović, 2001). In addition, in 2000 the semi-parliamentary form of government was replaced with the parliamentary one which consequently limited the powers of the President and strengthened the role of the Government¹⁶. Considering that Croatia has implemented a number of reforms in a relatively short period of time, it would be advisable in future research to analyse whether these reforms are reflected in the size and composition of government spending, budget balance and public debt. Although so far there has been no detailed research on this issue, it can be concluded that the reform introducing a proportional electoral system increased the frequency of coalition governments. Since 2000 Croatia has had some form of coalition government, and this, according to theoretical assumptions and the results of empirical analysis, leads to an increase in government spending. This finding is important since with more frequent coalition governments, there is a higher probability of common-pool problem between ruling parties where each of them will try to benefit their own constituencies thus increasing the total government expenditure (Voigt, 2009). All of this could also have had an impact, primarily through the decrease of accountability, on voters in Croatia – both on their decisions regarding which party to punish (reward) in the case of adverse (favourable) economic performance as well as on decrease diminution in voter confidence in the government. Therefore, the findings obtained in this paper could contribute further to discussions on potential reforms of electoral system (or some of its dimensions) in Croatia.

5 CONCLUDING REMARKS

A review of theoretical predictions and previous empirical research has shown that political institutions affect the outcomes of economic policy. However, the detailed mechanisms through which specific institutions affect different outcomes are ambiguous and the empirical literature in this area is still faced with numerous challenges. Results of the empirical analysis performed in this paper show that statistically the most significant effect on government spending comes from government fragmentation and political (in)stability, which is in line with previous studies suggesting that the electoral system has an indirect impact on policy outcomes. It has been shown that higher government fragmentation leads to an increase in government spending. This result is important for Croatia, which during the analysed period had some form of coalition government, an institution that is usually characterized with common-pool and the collective decision-making pro-

¹⁶ The main characteristics of the presidential form of government were high concentration of power in the institution of the President who was the main actor in the political system as well as the high personification of politics.

blems. However, given that there are still some dimensions of electoral systems that are not considered in this paper, which also can have an impact on the design of fiscal policy, one should be careful with interpretation of results regarding the superiority of one electoral system over another.

Taking into account all of the limitations of the research (endogeneity of political institutions, the sample size and time period), the findings in this paper are preliminary. The main objective is to encourage further discussion in this research area, which has not previously been analysed in this way in Croatia. Moreover, with the negative effects of the global economic crisis one can expect that more attention will be directed towards the positive and normative aspects of constitutional political economy.

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Money laundering: correlation between risk assessment and suspicious transactions

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Review article**

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Abstract

The risk assessment system was introduced in the Republic of Croatia in 2009, as a result of harmonization with international standards, especially the Directive 2005/60/EC on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing. Risk assessment is an extensive concept which requires not only a legislative framework, but also the application of numerous criteria for its effective implementation in practice. Among these criteria are suspicious transactions, closely related to the assessment of the customer, transaction, product or service.

The undeniable contribution of suspicious transactions to the quality of the risk assessment system will be confirmed by a statistical analysis of a number of West and East European countries. A combination of strict, but sufficiently flexible legal provisions governing the system for prevention of money laundering and terrorist financing and a statistical analysis of reported suspicious transactions will lead to conclusions that either support or represent criticism of the efficiency of application of the risk assessment system in practice.

The aforementioned statistical analysis will show whether suspicious transactions are a reliable criterion for the risk assessment analysis, and whether they can be considered the only such criterion. There is a possibility that the findings of the analysis will be contradictory to those of some international studies.

Keywords: money laundering, suspicion, transaction, risk, risk assessment, statistics, analysis

1 INTRODUCTION

The variety of possibilities to convert illegal into apparently legal money suggests that money laundering is a complex activity. Without prejudice to the unbounded sophistication, inventiveness and imagination of money launderers in finding perfect way to launder money, preventive measures to this effect include the detection of cash and suspicious transactions through risk assessment, i.e. the application of a risk-based system¹.

This raises the issues of implementation of the idea of money laundering prevention through risk assessment, the legality of its practical consequences and logicity of its realisation. Resolving these issues requires understanding of the definition and nature of risk assessment. In this context, suspicious transactions represent the backbone of any money laundering prevention system, the analysis of which will show how the risk assessment operates in practice.

¹ The “risk-based system” is a money laundering prevention system based on risk assessment, as opposed to a “rule-based system” which relies on strictly defined rules.

2 MEANING OF THE “RISK-BASED APPROACH” SYSTEM

The primary characteristic of the money laundering prevention system based on risk assessment is that it is complex and necessarily resilient. While on the one hand the financial and non-financial sectors are required to apply some basic prevention rules, on the other hand they are supposed to have their own approaches to risk assessment, and hence to the reporting of suspicious transactions.

The main principle underlying any system for the prevention of money laundering and terrorist financing is that the higher the risk of money laundering the closer the attention needed from all competent institutions. Yet, following this principle is far from simple. Unlike with the rule-based system² applied so far, the logic behind the risk-based system is entirely different.

A system based on rules initially requires from all those responsible for the prevention to apply clear and rigid rules in legally prescribed situations. Within such a system, financial and non-financial institutions, being the chief agents of prevention, are focused on meeting the precisely defined legal conditions (treating them equally) rather than on “taking the pulse” of potential money launderers.

A much greater effort is required to change the perception of the importance and scope of money laundering prevention, from the routine fact-finding prescribed by law to the assessment of each client through a sophisticated risk assessment filter. Unavoidable in this context is the appropriate application of the legislation as well as guidelines and indicators to be adjusted to each particular case and then used in practice.

Accordingly, the risk assessment system requires not only the assessment, but also classification of risks and their materialisation in the form of suspicious transactions. While suspicious transactions constitute the backbone of the risk, it is clear that there are no universally accepted methodologies to describe the nature and scope of such transactions. They appear through the identification and classification of the money laundering and terrorist financing risks, which results in the establishment of control mechanisms tailored to the detected risk.

This statement does not mean the absence of any principled rules applying to the customer and the customer’s business. The imposed rules only represent a framework for action, with a certain degree of flexibility of implementation, in accordance with the risk assessment for each category of customers, transactions, products or services rendered.

² The “rule based system”, i.e. a system based on rules was presented in the first two EU directives on prevention of the use of the financial system for money laundering purposes (Directive 91/308/EEC and Directive 2001/97/EC amending the Directive 91/308/EEC).

2.1 RISK CATEGORISATION

The FATF Guidance on the Risk-Based Approach to Combating Money Laundering and Terrorist Financing indicates three steps in an effective implementation of the risk-based approach, namely the risk detection, risk assessment and development of strategies to manage and mitigate the risks (Financial Action Task Force, 2007). The risk, as the basic concept, is closely related to the customer, product of service, including the manner of conducting transactions and geographic location of the country assessing the risk.

The said FATF Guidance recognises three risk categories: low risk, high risk and innovation (new technologies to ensure anonymity). The fourth category comprises mechanisms for the analysis of applied procedures for deciding on the level of risk, the way of acting upon identified risks and the evaluation of such actions. Risk assessment should be tailored to each customer, product or service, by employing a measure corresponding to the degree of identified risk. However, it is not unthinkable that two financial institutions could take different decisions on the basis of similar parameters.

This reaffirms the fact that the risk assessment method is not easy to apply. The sharper the deviation from the risk assessment principle the stronger is the possibility of negative consequences. While the overestimation of risk is impossible due to limited time, personnel and information sources, its underestimation is an unacceptable alternative. A good risk assessment system should primarily be balanced. To this effect, an efficient application of the risk-based approach should include the undertaking of customer due diligence, as well as effective supervision and information exchange between the financial intelligence unit (hereinafter: FIU) and all institutions participating in the prevention of money laundering and terrorist financing.

3 SUSPICIOUS TRANSACTIONS

The money laundering risk assessment by its nature consists in the filtering of all available information in order to identify suspicious transactions or customers. Given the complexity of the money laundering process, it is clear that the detection of suspicious transactions involves a set of different preventive measures.

If the money laundering stages are viewed from the perspective of implementation of the money laundering risk assessment, the placement and layering stages are the most relevant in the process of transforming money into a more convenient form of assets (Cindori, 2010). Despite the differences in the money laundering modalities with respect to the amount of money to be laundered, relevant legislation, economic situation, financial market, chosen method of operation (through the financial or non-financial sector), as well as the actual (stages of the) process through which the dirty money goes, the money laundering risk can be most easily

assessed during these two stages, because they offer unlimited opportunities to carry out due diligence of the customer, a product or a transaction.

At the first stage, by placing money into the financial system or converting it into another form of assets, money launderers are already subject to customer due diligence, i.e. the application of the risk-based system. At the second stage, cash is deposited in one or several accounts (held by one or more persons) with a view to fragmenting large amounts of money and channelling them to various natural or legal persons and changing the form of money. The activities subsequently carried out by legislators for prevention purposes, i.e. the detection of suspicious or illogical transactions, most frequently constitute *modus operandi* at the layering stage. From this perspective, it is easy to conclude that suspicious transactions are very difficult to detect at the third money laundering stage (integration stage).

3.1 SUSPICIOUS TRANSACTIONS IN THE EUROPEAN UNION

The EU directives on prevention of the use of the financial system for money laundering purposes very clearly show the evolution of the definition of suspicious transaction. By setting up the fundamentals of a prevention strategy to combat money laundering, these directives impose the need for harmonization and adjustment of national legislations. In this context, the need is emphasized to set up an anti-money laundering system relying on “a risk-based approach”, which will increase the importance of suspicious transactions and their treatment.

The first attempts to set up a framework for preventive measures in the area of anti-money laundering were made in the Directive 91/308/EEC (hereinafter: First Directive), which was the first to define, although very elastically, the term “suspicious transaction”. As this definition required from credit and financial institutions to check *each transaction that might be connected with money laundering*, the content of the term was obviously vague and it should necessarily undergo legislative revision at the national level. Taking into account that the First Directive was only guidance for action at the national level, despite the very elastic definition of suspicious transactions it provided (Graham, Bell and Elliott, 2006), it in a way created a basis for preventive action.

The Directive 2001/97/EC (hereinafter: Second Directive) does not go much further in developing the definition of suspicious transactions, but it identifies independent professions and occupations that are exempt from the obligation to report suspicious transactions in certain cases³.

In contrast to the first two directives, the Directive 2005/60/EC on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing (hereinafter: Third Directive) is based on risk assessment and hence it

³ For more information, see Article 1, item 5 of the Second Directive.

deals with the issue of detecting suspicious transaction in an entirely different way.

The Third Directive assigns a new role to suspicious transactions, seeing them (indirectly) as the backbone of money laundering prevention through a risk-based system. In the Directive, the term “suspicious transaction” is not explained in the form of a definition, but is “hidden” in Article 20 (Reporting Obligations). While it, to some extent, repeats the definition from the First Directive, this Article expands the concept of suspicious transactions to include complex and unusual transactions, specifying and elaborating on the concept of “being suspicious”⁴. All this said, there is no doubt that suspicious transactions are important for setting up a money laundering prevention system, as reflected in the obligation of all institutions and persons covered by the Third Directive to carry out customer due diligence, which is a signal of a new, risk-based approach to suspicious transactions.

The implementation of customer due diligence measures and their content clearly suggest that the perception of money laundering goes far beyond the disposing of cash, and the suspicion of money laundering exists from the customer identification at the moment of (or before) establishing a business relationship to the verification of data. Suspicion also exists when carrying out other due diligence activities which require an ongoing gathering of information on the purpose and envisaged nature of the business relationship and its continuous monitoring, with a view to creating the customer, business and risk profiles and identifying the source of the customer’s funds.

Similar development logic of suspicious transactions can be found in the FATF Recommendations. Significant changes towards risk assessment can be observed in the latest revised FATF Recommendations 2012. Both financial and non-financial sectors are increasingly focused on higher-risk areas, while the measures applicable to lower-risk areas become simpler and more elastic.⁵

4 RISK ASSESSMENT SYSTEM IN THE REPUBLIC OF CROATIA

The legislation of the Republic of Croatia has been developed in accordance with the three aforementioned directives.

The first anti-money laundering law was passed in 1997. The definition of suspicious transactions was not given separately, but it arose from the content of customer identification procedures⁶, which did not specify the characteristics of a suspicious transaction, but a suspicious transaction was considered to be “any cash or non-cash transaction for which there is suspicion of money laundering”.

⁴ For more information, see Article 22 of the Third Directive.

⁵ The Revised Recommendations are available at: [<http://www.fatf-gafi.org/topics/fatfrecommendations/documents/internationalstandardscombatingmoneylaunderingandthefinancingofterrorismproliferation-thefatfrecommendations.html>].

⁶ For more information, see Article 4 of the Anti-Money Laundering Act (Croatian version, OG 69/97).

By introducing amendments to the Anti-Money Laundering Act⁷ (hereinafter: AMLA) considerable progress was made in this respect, but without any substantial changes in the operation of the Anti-Money Laundering Office (hereinafter: Office). There was still no definition of suspicious transactions, although the term was used in the general provisions on the activities of the Office in “detecting *suspicious transactions*, concealing the true source of money, property or a right suspected to have been obtained illegally in the country or abroad”⁸. While this undoubtedly emphasized the importance of suspicious transactions, it was quite certain that the Office’s activities were still focused on cash transactions⁹.

By following the Third Directive, the Republic of Croatia introduced a new Anti-Money Laundering and Terrorist Financing Act¹⁰ (hereinafter: AMLTFA), thereby adopting the risk assessment system. In other words, the necessity to carry out customer due diligence and risk assessment as crucial measures has been mentioned throughout the AMLTFA. Consequently, suspicious transactions play a leading role in the detection of money laundering and terrorist financing. This is reflected in the obligation of the Office to carry out analytical data processing exactly on the basis of substantiated reasons for suspicion of money laundering or terrorist financing.

Besides suspicious transactions, the AMLTFA also recognizes complex and unusual transactions. In contrast to suspicious transactions that arouse a certain degree of suspicion sufficient for establishing a criminal offence, an unusual transaction is considered to be any illogical transaction in relation to which no criminal offence has yet been established. Given these criteria, it is beyond doubt that a large number of reported suspicious transactions actually constitute unusual or illogical transactions (Savona, 2004).

This is exactly why the legislator emphasized the need to pay close attention to all complex and unusual transaction, as well as to any other unusual form of transaction having no obvious economic or legal purpose¹¹. The risk assessment system definitely requires that such transactions be monitored, even in situations when no reasons for suspicion of money laundering or terrorist financing have yet been identified.

⁷ Amendments to the Anti-Money Laundering Act (Croatian version, OG 117/03).

⁸ The amendments to the existing Act were in accordance with the international standards then in force, i.e. Article 3, paragraph (8) of the Second Directive, and FATF Recommendations Nos 13 and 11.

⁹ For more information, see the Ministry of Finance Annual Reports 2005-2008: [<http://www.mfin.hr/hr/godisnjaci-ministarstva>] and Moneyval reports: [http://www.coe.int/t/dghl/monitoring/moneyval/Evaluations/Evaluation_reports_en.asp].

¹⁰ Anti-Money Laundering and Terrorist Financing Act (Croatian version, OG 87/08).

¹¹ For more information, see Article 43 of the AMLTFA.

4.1 DEFINITION AND ASSESSMENT OF RISK

The guiding principle of the AMLTFA arises from the risk assessment, as shown in Article 7 of the Act, providing a definition of the money laundering and terrorist financing risks. The focus is principally on the risk that a customer might misuse the financial system for money laundering or terrorist financing, or that a business relationship, a transaction or a product might be directly or indirectly used for money laundering or terrorist financing purposes.

In order to reduce the risk, reporting entities are obliged to undertake a risk analysis and use it for assessing the risk of a group or type of customers, a business relationship, a product or a transaction with respect to their potential misuse for money laundering or terrorist financing purposes. In this context, reporting entities may include in the group of customers representing a negligible risk only the customers determined by a rulebook laid down by the finance minister. The limitation regarding risk assessment arises from the reporting entity's obligation to comply with the guidelines issued by competent supervisory authorities. In other words, during the risk analysis and assessment both the reporting entity and supervisory authority are obliged to consider the specific characteristics of the reporting entity and its business, while taking into account the size and organisational structure of the reporting entity, the type of customers it deals with and the type of products it offers.

4.2 DEFINITION OF SUSPICIOUS TRANSACTIONS

The risk assessment procedure inevitably entails the definition of the concept of "suspicious transactions". Treating risk assessment as the guiding principle, the AMLTF treats suspicious transactions with equal care, surpassing the criteria set in accordance with international standards.

In light of this, according to the Act, a suspicious transaction is any attempted or executed cash or non-cash transaction, regardless of its value and the manner of its execution. Already in the first part of the definition the legislator emphasizes the active role of a reporting entity in the detection of (innovative) money laundering or terrorist financing attempts. The definition further indicates three characteristics a transaction may (but not necessarily must) have in order to be considered as suspicious:

- a) it must be connected with illegal sources or funds or with terrorist financing;
- b) it must deviate from a customer's normal operation, taking into account the set indicators; and
- c) there must be an attempt to find loopholes in the law.

Besides these possible reasons for suspicion of money laundering, established on the basis of categorisation, considered as suspicious is also any transaction or cu-

stomer for which/whom the reporting entity deems that there are reasons for suspicion of money laundering or terrorist financing¹².

As suspicious transactions, by their very nature, pose high money laundering and terrorist financing risks, each reporting entity is obliged to detect them within its activity, taking into account the specificities of the business. This confirms that the AMNLTA is founded on risk assessment, the monitoring of the customer's operations and collection of information on the purpose and envisaged nature of the business relationship. This is why the compilation of a list of indicators for the detection of suspicious transactions and persons in relation to which there are reasons for suspicion of money laundering or terrorist financing is within the competence of the reporting entity¹³.

4.3 TREATMENT OF SUSPICIOUS TRANSACTIONS

Besides the aforementioned definition of a suspicious transaction, the AMLTFA, in its very introduction, defines a suspicious transaction as any transaction for which a reporting entity and/or a competent authority deems that there are reasons for suspicion of money laundering or terrorist financing in relation to that transaction or a person conducting the transaction, or a transaction suspected to involve funds derived from illegal activities. While it is emphasized that a competent authority can also assess a transaction a suspicious, based on a subsequently conducted strategic analysis, the focus is also on the importance of such transactions for the prevention of money laundering and terrorist financing.

In order to be classified as suspicious, transactions must be previously passed through the risk assessment filter, i.e. subjected to customer due diligence measures. The customer due diligence measures comprise identifying the customer and the beneficial owner and verifying their identities, as well as collecting information on the purpose and intended nature of the business relationship or a transaction. Besides these due diligence measures, it is particularly important to conduct ongoing monitoring of the business relationship to ensure the implementation of the risk assessment system in the way that the transaction analysis is consistent with the reporting entity's knowledge about the customer, type of business and risk, including, where applicable, information on the sources of funds¹⁴.

The same reasoning applies to the supervision of reporting entities. The Financial Inspectorate supervises compliance with the AMLTFA of all reporting entities exclusively on the basis of the assessment of money laundering and terrorist financing risks. In this context, should the Inspectorate establish that a legal person, a

¹² A definition of suspicious transactions is given in Article 42 of the AMLTFA.

¹³ For a full and comprehensive overview, the supervisory authorities cooperate with reporting entities in the compilation of the list of indicators. Similarly, the minister of finance may, in a special rulebook, prescribe mandatory inclusion of particular indicators in the list of indicators for the detection of suspicious transactions and persons in respect of which there are reasons for suspicion of money laundering or terrorist financing. For more information, see Article 41, paragraphs (5) and (6) of the AMLTFA.

¹⁴ Article 8 of the AMLTFA.

member of the management board (or another responsible person of the legal person), or a natural person has failed to make a risk analysis, or risk assessment for a particular group or type of customers, business relationships, products or transactions, or if such persons have failed to align the risk analysis and assessment with the guidelines issued by a competent supervisory authority, it can impose a fine on such persons for the committed violations¹⁵.

4.4 ACTING UPON SUSPICIOUS TRANSACTIONS

The treatment of suspicious transactions is also reflected in the manner of reporting suspicious transactions and of how the Office acts upon them. Should a reporting entity, after the risk analysis, know or suspect that a transaction is connected with money laundering or terrorist financing, it should notify the Office of such a transaction without delay¹⁶ prior to the execution of the transaction. The notification should be sent by telephone, fax or in another appropriate way, indicating all reasons for the suspicion of money laundering or terrorist financing and the deadline for the execution of the transaction¹⁷. Particularly important is the submission of information on the intention and planning to carry out a suspicious transaction, regardless of whether the transaction has subsequently been executed or not¹⁸.

By following the same line of logic, the commencement of the analytical processing by the Office is closely related to the transactions or persons in respect of which a reporting entity or a competent authority “submits substantiated reasons for suspicion of money laundering or terrorist financing”¹⁹. Thus, the legislator has placed emphasis on the fact that the Office should act upon transactions for which the risk analysis has been made, and has limited any action based on strict compliance with the rules. As a consequence of this, the number of “formally”

¹⁵ A legal person will be fined between HRK 50,000 and HRK 700,000 and a member of the management board or another responsible person of the legal person will be fined between HRK 6,000 and HRK 30,000. A natural person who is a craftsman or a natural person engaged in another independent activity will be fined between HRK 35,000 and HRK 450,000 for the same violation. For more information, see Article 90 of the AMLTFA.

¹⁶ Exempt from the obligation to report suspicious transactions is a group of professions and occupations, such as lawyers, notaries public, auditors and natural and legal persons providing accounting and tax consulting services, with respect to the information obtained from customers or about customers during the determination of the legal status of a customer or its representation in the court proceedings (including counselling the customer to propose or avoid legal proceedings), regardless of whether the information was obtained or collected before, during or after the proceedings. For more information, see Article 55 of the AMLTFA.

¹⁷ We are talking here about an “active” role of the reporting entities based on their initiative, as opposed to a “passive” obligation to submit data additionally requested by the Office (Mitsilegas, 2003).

¹⁸ Should it be necessary to take urgent action to verify data on a suspicious transaction or person, or should the Office deem that there are reasons for suspicion that a transaction or a person is connected with money laundering or terrorist financing, the Office may issue a written order instructing the reporting entity to temporarily suspend the execution of the suspicious transaction for a maximum of 72 hours. The Office will notify the State Attorney’s Office and/or the competent State Attorney’s Branch Office without delay of the issued orders. For more information, see Article 60 of the AMLTFA.

¹⁹ Exceptionally, the Office may commence the analytical processing of suspicious transactions at a substantiated written proposal of the competent authorities, but only if such activities might be connected with money laundering or terrorist financing. For more information, see Article 64 of the AMLTFA.

open cases, encouraged under the old AMLA, was now reduced, which released additional resources for the Office²⁰.

4.5 COMPLEXITY OF THE SCOPE OF “SUBSTANTIATED REASONS FOR SUSPICION”

The way the Office acts upon “submission of substantiated reasons for suspicion of money laundering or terrorist financing” shows that the Office does not consider only suspicious transactions, but also all other transactions, either cash or linked transactions, for which it receives *substantiated reasons for suspicion of money laundering or terrorist financing* from a reporting entity.

The money laundering methods and typologies used by natural persons support the need for such an approach, but also for a more flexible, risk-based procedure. For example, depositing unusually large cash amounts, as a money laundering typology used by natural persons, includes cash deposits in all types of accounts which deviate from the normal customer’s account turnover. These are usually considerable amounts derived from illegal activities and representing illegal income of the customer. Most transactions of this type are not consistent with the business and economic criteria.

The very name of this money laundering method suggests that it deals with cash deposits, i.e. cash transactions. However, as the content of the term “unusually” (large amounts) varies from customer to customer, and is determined, e.g. by a customer’s business background, the values of such suspicious or illogical transactions very often remain below the legally prescribed limit for “cash transactions” subject to reporting to the Office. In assessing the risk of such transactions and identifying the character of their dubiousness, the first thing to do is to organise training for employees of financial and non-financial institutions who should be able, based on the indicators of suspicious transactions and information on the customer’s business, to detect a suspicious transaction and establish whether a business is really illegal.

As unusual or large cash deposits are conspicuous and open up further possibilities of a quick detection of money laundering cases, the so-called “linked transactions” are usually used in practice. They imply breaking down a large amount into several smaller amounts (to evade the reporting threshold for cash transactions), because smaller cash amounts apparently represent a better way of money laundering.

The breaking down of a transaction into smaller amounts and creation of “linked transactions” in order to evade the reporting requirements is referred to in English

²⁰ The legislative changes led to a restructuring of the Office, i.e. the establishment, among other departments, of a Prevention and Customer Supervision Department and a Strategic Analysis and IT System Department. For more information, see Regulation on the Internal Organisation of the Ministry of Finance (Croatian version, OG 29/09).

literature as “structuring”. Richards uses the same term explaining it as follows: “a person structures a transaction if that person, acting alone, or in conjunction with, or on behalf of other persons, conducts, or intends to conduct, one or more transactions in currency, in any amount, at one or more financial institutions, on one or more days and in any manner, for the purpose of evading the reporting requirements...” (Richards, 1998)²¹. Given this definition of the term “structuring”, it is beneficial to use the suspicious transaction indicators in order to facilitate the detection of linked transactions which are in themselves defined elastically, due to the complexity of their execution and impossibility of their strict regulation.

Consequently, it is obvious that, like cash and suspicious transactions, linked transactions can also be the subject of consideration for the Office, provided that there are “substantiated reasons for suspicion of money laundering or terrorist financing” with respect to such transactions. They will be considered as suspicious transaction and recorded in the Office’s statistics. Concrete analyses of suspicious transactions will show why this is important and what we can learn about the risk-based system from the statistics on reported suspicious transactions.

5 AN ANALYSIS OF SUSPICIOUS TRANSACTIONS AS RISK ASSESSMENT SYSTEM ANALYSIS

The application of a risk-based based system is far from being simple, from the perspectives of both legislative regulation and practical implementation efficiency. The complexity of the system is due to suspicious transactions, the content of which is indeterminable while their scope must not be limited. It is exactly this legislative philosophy that the risk assessment system is based on.

In order to prove the efficiency of application of such a system in the Republic of Croatia, we compared the statistics on suspicious transactions reported in the period 2005-2010 across ten countries of different sizes and at different levels of development and compliance with international standards.

5.1 IMPACT OF THE RISK-BASED APPROACH ON THE NUMBER OF REPORTED SUSPICIOUS TRANSACTIONS

According to the Final Study on the Application of the Third EU Directive on the prevention of the use of the financial system for the purpose of money laundering (hereinafter: Final Study)²², a risk-based system has a positive influence on reporting on suspicious transactions, in terms of the number of reported suspicious or unusual transactions, quality of such reports and their effects on the detection of suspicious transactions.

²¹ There have been similar considerations in the Republic of Croatia long before the introduction of the legislation prescribing anti-money laundering measures. Hršak wrote about linked transactions as far back as 1993, as “large-scale financial operations broken down into a series of smaller transactions in small amounts of money” (Heršak, 1993).

²² Available at: [http://ec.europa.eu/internal_market/company/docs/financial-crime/20110124_study_aml_d_en.pdf].

In the discussion on the “number of reported suspicious transactions” criterion and its relationship to the “quality of the reports” criterion in the said Final Study, it is emphasized that these two criteria are interdependent, i.e. that there is an increase in both the number of reported suspicious transactions and the quality of the reports, as a consequence of the application of the risk-based approach (as opposed to the previously applied rule-based approach).

As the application of the risk-based approach in the Republic of Croatia shows a completely opposite trend, i.e. a fall in the number of reported transactions, this problem demands closer attention in order to establish the real correlation between the number of reported suspicious transactions and the achievement of the main goals of the risk assessment system.

TABLE 1

Reported suspicious transactions related to money laundering, 2005-2010

Country	2005	2006	2007	2008	2009	2010
Bulgaria	680	374	431	591	883	1,460
France	11,553	12,047	12,481	14,565	17,310	19,208
Croatia	2,908	2,891	2,857	2,323	629	602
Liechtenstein	192	161	205	157*	235	261*
Germany	8,241	10,051	9,080	7,349	9,046	11,042
Romania	3,858	3,195	2,574	2,332	2,259	2,925
Slovenia	116	165	192	248	199	233
Serbia	138	622	1,432	2,884	3,957	4,537
Switzerland	729	619	795	851	896	1,159
Ukraine	350,507	313,074	322,966	290,418	227,192	96,221**

* Reports on suspicious transactions received by 1 October 2008/2010.

** Reports on suspicious transactions received by 1 August 2010.

Source: MONEYYVAL²³ Reports and Annual Reports of the stated countries.

5.1.1 A fall in the number of reported suspicious transactions

In order to understand the real nature of the risk assessment system and its correlation with the number of reported suspicious transactions, an analysis will be made of a fall in the number of reported suspicious transactions, observed in the Republic of Croatia, Slovenia and Ukraine.

5.1.1.1 Croatia

The data on suspicious transactions related to money laundering, reported to the Office in the period 2005-2008 clearly show that their number was constant. With the entry into force of the AMLTFA in 2009, under which the risk-based approach was used in the detection and reporting of suspicious transactions, the number of suspicious transaction reports decreased up to five times (in 2009 and 2010). A comparison between the four-year period of application of the AMLA (2005-

²³ Available at: [http://www.coe.int/t/dghl/monitoring/moneyval/Evaluations/Evaluation_reports_en.asp].

2008) and the two years of application of the AMLTFA (2009-2010) clearly shows that half as many suspicious transactions (on average) were reported in the two-year period of applying the risk-based approach as in one year of application of the rule-based approach.

The established decline in reported suspicious transactions was due to the application of the AMLTFA, which provides a very detailed description of the nature of suspicious transactions. Besides in the AMLTFA, suspicious transactions are also dealt with in the Regulations on the Notification of the Anti-Money Laundering Office of Suspicious Transactions and Persons²⁴, with a detailed specification of the manner of and deadlines for reporting, as well as additional information to be submitted to the Office, and the electronic data delivery.

As a result of a detailed prescription of the content of a suspicious transaction and of assigning an active role to reporting entities²⁵ in setting up indicators for the detection of suspicious transactions, as well as their frequent participation in the training measures (in 2009 and 2010)²⁶, the statistics only confirm an improvement in the quality of reports on suspicious transactions to the detriment of their quantity. Reporting entities have thus shown their maturity in the assessment of risks and detection of suspicious, unusual or illogical transactions. This mainly applies to the financial sector, i.e. banks, because they accounted for 90% of total suspicious transactions reported in the period 2005-2008, while this share dropped to 50% in the period 2009-2010. Nevertheless, the number of suspicious transaction reports coming from the non-banking and non-financial sectors remained unchanged, leaving a plenty of room for improvement and the overall system development.

Another reason for the expected evolution of the risk assessment system in terms of the number of open cases and forwarded notifications of suspicious transactions (NST²⁷) is that in the period 2009-2010, 642 cases were opened and 235 NSTs sent to the competent authorities for further processing pursuant to the received reports on suspicious transactions. Or, out of 1,231 suspicious transactions reported by reporting entities in the period from 2009 to 2010, the Office opened 642 cases (52% of suspicious transactions reported in this period), whereas 235 NSTs submitted account for 19% of the total suspicious transaction reports.

²⁴ Regulations on the Notification of the Anti-Money Laundering Office of Suspicious Transactions and Persons (Croatian version, OG 1/09).

²⁵ Entities subject to the measures, actions and procedures for the prevention and detection of money laundering and terrorist financing are specified in Article 4 of the AMLTFA.

²⁶ The Ministry of Finance Annual Reports for 2009 and 2010; available at: [<http://www.mfin.hr/hr/godisnjaci-ministarstva>].

²⁷ Notifications of suspicions of money laundering or terrorist financing in the country or abroad, submitted by the Office to the competent state authorities and the responsible foreign FIU for further processing.

5.1.1.2 Slovenia, Romania and Ukraine

Slovenia also saw a decline in reported suspicious transactions in 2009. However, worth noting are some typical characteristics of the money laundering (and terrorist financing) prevention practice in Slovenia. The Slovenian Anti-Money Laundering and Terrorist Financing Act²⁸ came into force in mid-2007. A comparison between the number of suspicious transaction reports in 2005 (116) and 2006, when a rule-based approach was used (165), suggests their increase. But as early as 2007, after the harmonisation of the national legislation with international standards and the introduction of a risk assessment system in the middle of the year, only a minor increase was observed in reported suspicious transactions (192), probably due to the new principle of operation. In 2008, however, their number rose to 248, but fell again to 199 in 2009. Another increase in the number of reported suspicious transactions was seen in 2010 (233). As these were only slight changes in the already small number of reported suspicious transactions, and one could hardly talk about regularity in the number of suspicious transactions as the result of application of the risk assessment system. The only constant was the active participation of the financial sector, notably banks, (with 75% to 80%) in the total number of reported suspicious transactions in the period 2008-2010²⁹. Nevertheless, the fact that the total number of reported suspicious transactions equals the number of open cases suggests that there is some degree of awareness among Slovenian reporting entities about this matter and that Slovenia's Office works efficiently.

Like most countries, *Romania* aligned its legislation with international regulatory standards as late as 2008, although it had recognised the importance of the prevention of terrorist financing back in 2002. Judging by statistics, a downward trend in reported suspicious transactions was observed in the period 2005-2009, with the exception of 2010, when an increase was recorded. As the number of suspicious transactions went up (to 2,925 in 2010), credit and financial institutions continued to account for a large share (90%) in total reported suspicious transactions. In 2010, however, the number of reported suspicious transactions increased by 29% from 2009, as a result of training within a twinning project in cooperation with the Polish FIU³⁰ and the application of on-line reporting parameters (Cindori, 2008). The increase in the number of suspicious transactions by raising the awareness of the financial sector (primarily through training) certainly suggests a positive trend. However, giving prominence to on-line reporting as an indicator of an (artificial) increase in this number is surely negative.

²⁸ Zakon o preprečevanju pranja denarja in financiranja terorizma (Ur. l. RS 60/07).

²⁹ Poročilo o delu Urada Republike Slovenije za preprečevanje pranja denarja za leto 2010; available at: [http://www.uppd.gov.si/si/delovna_podrocja/podatki_o_delu_urada/].

³⁰ Main elements related to National Office for Prevention and Control of Money Laundering's activity, performed within the year 2010, Synthesis of the activity report; available at: [<http://www.onpcsb.ro./pdf/NOPCML%20Report%202010.pdf>].

Besides Croatia, Slovenia and Romania, *Ukraine* is also on the list of countries showing a downward trend in suspicious transaction reporting. This country is special in terms of its system for the prevention of money laundering and terrorist financing, as it had no adequate national legislation to this effect until 2003, but exclusively followed the relevant international standards, primarily the FATF Recommendations. It was therefore put on a “blacklist” of non-cooperative countries (Cindori, 2010). Based on a Law on the Prevention of and Counteraction to Legalisation (Laundering) of Illegal Proceeds from Crimes that entered into force in 2003, the country established a money laundering prevention system and harmonised its legislation with the Third Directive by introducing a Law on the Prevention of and Counteraction to Legalisation (Laundering) of Illegal Proceeds from Crimes and Terrorist Financing in 2010.³¹

Despite the small size of Ukraine, statistical data suggest an enormous number of reported suspicious transactions in the country. Despite a fall in these transactions from 350,000 in 2005 to 96,221 in 2010, their number is still huge. Even the smallest recorded number of suspicious transactions (96,221) reported in 2010 (the figure refers to the period before 1 August 2010) is 160 times the number of such transactions reported for the same year in, e.g. Croatia (602). According to the statistical data given in table 1 and their comparison with the data on reported suspicious transactions in Ukraine, the real number of reported suspicious transactions is expected to decline in the future, due to compliance with international standards and the implementation of a risk assessment system.

5.1.2 An increase in the number of reported suspicious transactions

In contrast to the described downward trend in reported suspicious transactions in Croatia, Slovenia, Romania and Ukraine, the Final Study supports the view that an increase in the number of reported suspicious transaction can be accounted for by a comprehensive implementation of the risk assessment system. The following statistics for a number of developed Western and North European countries will show whether this is really true and to what extent the evaluation of a risk assessment system can be based on the number of reported suspicious transactions.

5.1.2.1 Switzerland, France, the Netherlands and Germany

Switzerland saw a modest increase in reported suspicious transactions from 2006–2009, which was even sharper in 2010 (29%). In the Annual Report for 2010³² the upsurge in reported suspicious transactions was accounted for by the investigation of two complex cases in the banking sector which resulted in a large number of reports on suspicious transactions (144). Despite this, the banking sector continued to participate with 71% in the total number of reported suspicious transac-

³¹ Law of Ukraine on Prevention and Counteraction to Legalization (Laundering) of the Proceeds from Crime or Terrorist Financing as of 18 May 2010, No 2258.

³² Annual report by the Money Laundering Reporting Office Switzerland (MROS): a publication of the Federal Office of Police, Bern; available at: [<http://www.fedpol.admin.ch/content/fedpol/en/home/dokumentation/berichte/geldwaescherei.html>].

tions. An increase in the number of reports on suspicious transactions was also observed in the payment services sector, fiduciaries (trustees) and asset managers.

However, a real indicator of a highly developed risk assessment system is the number of suspicious transactions reported on the basis of own assessment rather than on the basis of strict legal provisions. The former type of reports is typical of the financial sector (banks and the payment service sector) and it accounts for one sixth of total reported suspicious transactions over the last eight years. The total number of reports based on own assessment grew in the reference period (2005-2010) due to legislative changes allowing the submission of reports directly to the MROS (the Swiss FIU) and not thanks to the criminal prosecution authorities.

We can therefore conclude that the Swiss system for prevention of money laundering and terrorist financing raises the awareness of the non-banking and non-financial sectors, which results in a larger number of suspicious transaction reports coming exactly from these sectors. However, an increase in the number of suspicious transactions reported on the basis of own assessment was also noticed.

Furthermore, the above described policy also raises the issue of delivery of information on attempted money laundering, i.e. on funds related to criminal organisations and funds derived from serious crimes, or generated by criminal organisations. This relates to a situation when a transaction has not yet been executed, or a business relationship has not yet been established³³. In such cases, it is difficult to prove the predicate offence, or initiate criminal proceedings. However, the Swiss Federal Law on Combating Money Laundering in the Financial Sector is primarily a preventive piece of legislation the purpose of which is achieved merely by preventing money launderers from the execution of actual transactions. Although the notifications of unexecuted transactions have not been sent to the MROS, money launderers have still failed to place the funds into the financial system, which markedly limited their activities.

France is another good example of the risk-based system implementation. The statistical review of reported suspicious transactions for this country in the period 2005-2010 suggests continued growth in their number. What makes the French system unique and highly effective is the decline in banks' participation in the total number of reported suspicious transactions (although this number has grown from year to year). In 2010, they participated with less than 75% in the total. A marked increase in suspicious transaction reports was observed in authorised exchange offices, due to the growing trade in gold and other precious metals, which is considered a safe investment in times of economic and financial crises. Besides, the increase in this type of transactions may also be due to innovative methods and techniques of money laundering aimed at avoiding the sophisticated anti-money laundering methods employed by the banking sector.

³³ Articles 305 and 260 of the Federal Act on Combating Money Laundering in the Financial Sector.

An increase in the number of reported suspicious transactions has also been observed in investment firms, financial investment advisers, brokers and portfolio management companies. A clear evidence of effective implementation of the risk assessment system in France is provided in the statistics of non-financial institutions, especially notaries public, auctioneers, casinos, auditors and chartered accountants³⁴ that suggest sizeable growth of suspicious transactions. Such a statistical analysis shows that money launderers have spared no effort in finding new, innovative ways of legalization of illicitly acquired funds. On the other hand, the French example shows the high awareness and willingness to detect suspicious and illogical transactions in all areas of prevention of money laundering and terrorist financing.

A statistical analysis of the Dutch system of prevention of money laundering and terrorist financing also gives positive results. In *the Netherlands*, suspicious transactions are statistically presented in the system of prevention of money laundering and terrorist financing at two levels: at the level of cash and the level of non-cash suspicious transactions. Despite being mentioned in the Final Study as a country with a falling number of reported suspicious transactions, this fall only relates to cash transfers (which totalled 32,100 and 29,795 in 2009 and 2010 respectively).

On the other hand, an increase in the number of reported suspicious transactions, established in the statistical analysis, relates to non-cash transfers (3,453 in 2009 and 4,408 in 2010). In the category of reported suspicious non-cash transactions, the share of banks in the total number of such transactions increased by 28% in 2010 from 2009. The same is true for suspicious transactions reported by casinos and payment card companies (although their relative shares in the total remained unchanged). By contrast, reported transactions involving non-cash transfers trended downwards, particularly in freelance occupations (-14%) and companies providing money transfer services (-19%). This negative trend does not support the implementation of the risk assessment system. Taking also into account the reduced share of banks in the total number of reported suspicious cash transactions, one can conclude that money launderers trying to legalize their illicit earnings increasingly use new technologies available within the financial sector, i.e. they use all forms of fund transfer offered by the modern technology.

A statistical analysis of the data on reported suspicious transactions in *Germany* shows a similar upward trend. In the period 2008-2010, the number of reported suspicious transactions increased, not only in the financial sector but also in insurance companies, tax advising companies, casinos and especially persons involved in trade. Compared with the data on suspicious transactions in table 1, Germany demonstrates a remarkable level of awareness of all institutions involved in

³⁴ Taken from the TRACFIN (2010).

the implementation of the system for prevention of money laundering and terrorist financing, especially those in the non-financial sector.

A 22% increase in the number of reported suspicious transactions (in terms of statistics), from 9,046 in 2009 to 11,042 in 2010, was rather insignificant, because almost 20% of transactions reported in the period 2009-2010 related to transfers of illicit funds across bank accounts to third persons and the theft of personal data from email accounts³⁵. Viewed from this perspective, the total number of suspicious transaction reports in the period 2007-2010 has not changed significantly. In other words, the application of a prevention strategy to combat money laundering and terrorist financing remained constant, with a slight increase in 2010.

The reason for such a modest increase lies entirely in the legislation. The treatment of suspicious transactions is regulated in Article 11 of the German³⁶ Act on the Detection of Proceeds from Serious Crimes, which provides that, should entities covered by the Act have grounds to believe that (regardless of the amount of a transaction) a crime pursuant to Article 261 of the German Criminal Code (money laundering) or terrorist financing has been committed or attempted, they should without delay verbally inform the competent authority thereof. In order to explain the “borderline of suspicion” in detecting suspicious transactions, the German FIU passed an opinion that covered entities must have knowledge, a suspicion or reasonable suspicion that money laundering or terrorist financing will be attempted or committed. As a result of the said explanation of Article 11 of the German Criminal Code, the number of reported suspicions transactions rose slightly in 2010.

However, all this said, and having particularly in mind the relatively small number of reported suspicious transactions, account should be taken of the fact that the German FIU is organised on the model of a police unit, which has certain consequences. Such FIUs are not suitable for direct contacts with non-financial institutions, as they are focused on investigation rather than on prevention measures. For this reason, they are constantly faced with distrust of financial institutions (notably banks), especially with regard to the categorisation of transactions that are not defined by legislation but show inconsistencies in operations. Indeed, such FIUs can be disinclined to “participate actively”, as required by financial institutions, especially in those banking systems where the banking secret has traditionally been regulated (Condemni and Pascal, 2005).

5.1.2.2 Serbia, Bulgaria and Liechtenstein

Serbia harmonised its legislation with international standards, notably the Third Directive, during 2009. Statistics on reported suspicious transactions (4,537) cle-

³⁵ For more information, see: Federal Criminal Police Office, FIU Germany Annual Report 2010; available at: [http://www.bka.de/nm_195184/EN/Publications/AnnualReportsAndSituationAssessments/FinancialIntelligenceUnitFiuGermany/financialIntelligenceUnitFiuGermany__node.html?__nnn=true].

³⁶ Act on the Detection of Proceeds from Serious Crimes (August, 2008).

arly point to their growth. However, it is interesting to note that the bulk of reports come from the financial sector, i.e. banks. Moreover, according to the Annual Report³⁷, total number of reported transactions (including cash and suspicious transactions) declined from 2009.

As this paper focuses on the value of the definition of suspicious transactions, which reflects itself in practice through statistical data, it is interesting to draw a comparison between the Croatian and Serbian legislations, as their conceptions are very similar, except for the substantial difference in the definitions of suspicious transactions. Despite similarities in the development history of the anti-money laundering legislation and harmonisation with international standards, statistical data show diametrically opposed results in practice.

A comparison between the Croatian and Serbian legislations and the statistical data presented in table 1, some conclusions can be drawn with respect to the implementation of the risk assessment system. The two countries' laws on the prevention of money laundering and terrorist financing do not only bear the same name, but they are also similar in content, although in Croatia, most essential issues are regulated by subordinate legislation (regulations). Nevertheless, there are differences in the treatment of suspicious transactions. Thus, while the Croatian Anti-Money laundering and Terrorist Financing Act provides a very detailed description of a suspicious transaction, there is no definition of this concept in the Serbian law. As concerns the obligation to submit data on suspicious transactions, Article 37 of the Serbian Act only generally lays down this obligation. Moreover, as a result of alignment with international standards and acting in accordance with the provisions of the AMLTFA, Croatia introduced radical changes in the concept of and reporting on suspicious transactions as early as next year (2009). During the reference period (2005-2010), Serbia saw a continuous increase in suspicious transaction reports, suggesting that, despite the new legislation, this country preserved its former principles of operation. In other words, the normative acceptance of a risk-based system was not adequately reflected in practice.

Bulgaria also saw an increase in the number of reported suspicious transactions in the period 2005-2010, with a surge recorded in 2010. The number of reported suspicious transactions rose from 883 in 2009 to 1,460 in 2010 (up 60%), exclusively due to a large number of reports coming from heads of Securities Registers and monetary institutions. In the period 2005-2009, banks accounted for as much as 80% of suspicious transaction reports (only 50% in 2010). Monetary institutions participated with 35% in the total number of suspicious transactions in 2010. The numbers of reports from other financial and non-financial institutions remained below average.

³⁷ Izvještaj o radu Uprave za sprečavanje pranja novca za 2010.

The last country covered by the statistical analysis of reported suspicious transactions in the period 2005-2010 is *Liechtenstein*. It appears in table 1 as a negative example of the risk-based system application, which is not too surprising, given that it was placed on the “blacklist” of non-cooperative countries in 2000. The attitudes of some countries to Liechtenstein in this respect have not changed significantly since then. Slovenia, for example, pursuant to Article 22 and 38 of its Anti-Money Laundering and Terrorist Financing Act, has put this country on a list of countries that pose ML/TF risks. Supporting this attitude is also the fact that the FIU of Liechtenstein (a country with 34,000 inhabitants and an area of 160 square kilometres) received 261 reports on suspicious transactions (the figure relates to the period ending 1 October 2010)³⁸. This shows that the increase in the number of reported suspicious transactions in this country, regardless of its compliance with international standards, is by no means the result of the risk-based system implementation. Otherwise, this figure would speak in favour of Slovenia’s ranking this country among the high-risk countries with respect to money laundering and terrorist financing. This is confirmed by the fact that the number of cases submitted to the competent authorities for further processing is very close to the number of reported suspicious transactions, which again equals the number of open cases at the FIU of Liechtenstein.

5.2 A BRIEF OVERVIEW OF ANALYSED COUNTRIES WITH REGARD TO THE RISK-BASED SYSTEM APPLICATION

As indicated in the Final Study, the upward trend in reported suspicious transactions in some of the observed countries really suggests that effective risk assessment systems are in place. Successful risk categorisation and assessment in Switzerland, France and Germany is reflected not only in a higher total number of reported suspicious transactions but also in the growing participation of the non-banking and non-financial sectors in this upward trend. However, the examples of Serbia and Bulgaria show that only one indicator, in our case the reports on suspicious transactions, is not enough evidence of the risk-based system implementation, because the statistical analyses in these countries have revealed an increase in reported suspicious transactions exclusively in the banking sector.

In Croatia, the number of reported suspicious transactions, which is obviously on the decline, also points to effective implementation of the risk-based system. This conclusion is based on the relevant legislation that provides a very detailed description of suspicious transactions, and on the active involvement of reporting entities in the prevention of money laundering and terrorist financing (through the formulation of indicators, education and, finally, being subject to penal provisions). The reports on suspicious transactions have thus gained importance and quality, as shown by the ratio between reported transactions and cases opened by the Office. However, there is still room for improvement.

³⁸ For more information, see MONEYVAL (2010).

The analyses of reported suspicious transactions for the Netherlands and Slovenia lead to several possible conclusions. Despite irregularities in reporting on suspicious transactions, (variability in the number of reports in the observed period), Slovenia shows an effective application of the risk-based system, given a low number of reported suspicious transactions that always equals the number of open cases at the Slovenian FIU. In the Netherlands, however, cash transactions are strictly separated from non-cash transactions, with a strong increase observed in suspicious non-cash transactions reported by banks, and a decline in the number of suspicious non-cash transactions reported by the non-financial sector. While these data do not corroborate the application of a risk-based system, the situation they describe can still be justified by new trends in money laundering.

Regardless of the fall in reported suspicious transactions in Ukraine and a rise in Liechtenstein, the conclusion of the reported suspicious transaction analysis for these two countries is obvious. The excessive total number of reports suggests deficiencies in several areas, from legislation through implementation in practice, which once again confirms that the number of reported suspicious transactions is an inadequate criterion for the efficiency evaluation of a risk assessment system.

To sum up, indicators of an efficient a risk-based system application must be sought in multiple areas, separately analysing each particular system for prevention of money laundering and terrorist financing, from the development of legislation to practical measures taken by each individual country.

6 CONCLUSION

Taking into account all efforts to define an effective money laundering prevention system based on risk assessment, comprehensive statistical data, as a reflection of practice, support the following conclusions:

- An effective risk assessment system requires an appropriate legal framework including a detailed definition of suspicious transactions, efficient supervision and appropriate sanctions in the cases of non-compliance with regulations.
- A risk assessment system requires that an increasing portion of suspicious transactions be reported by non-financial institutions as evidence of raising awareness in this sector.
- There is a need for ongoing education of all institutions involved in the implementation of anti-money laundering and terrorist financing measures at the national level.

These conclusions have also been supported by the previous statistical analysis of ten countries based on the criterion of an increase vs. decrease in the number of reported suspicious transactions. The effectiveness of a risk assessment system cannot be measured by the number of reported suspicious transactions. While in some countries, such as Switzerland, France, Germany and the Netherlands, such

an increase provides evidence of an effective risk assessment system being in place, in others, like Serbia, Bulgaria and Liechtenstein, it proves quite the opposite, even taking into account the organisational differences among the national FIUs.

Similarly, a fall in reported suspicious transactions in Croatia, Slovenia or Romania does not mean inadequate application of the risk-based system. On the contrary, by harmonising their respective legislations with the international money laundering and terrorist financing standards, these countries have proved their willingness to reduce the number of reported suspicious transactions, while ensuring high quality of their content.

The above analysis clearly demonstrates that informed decisions on a customer's behaviour or on an executed transaction can only be made on the basis of comprehensive legislation, ongoing education, an up-to-date perception of risks and, finally, learning on errors.

It follows that the development of any system, including the risk-based system, requires a wide range of information sources and thorough processing of information, as well as a long-standing practice, in order to ensure the best possible interpretation of collected information and its categorisation. The application of such a system provides a basis for further development of operational policies and procedures, while improving the system in order to successfully respond to new challenges on a daily basis.

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Initiation of corrupt exchanges and severity of corruption

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Article**

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Abstract

This paper examines the effectiveness of corruption control depending upon whether the bribe taker or the bribe giver initiates the corrupt interaction. The probability of corrupt exchanges depends upon the bribe and the corrupt market structure. The probability of apprehension is set but punishment can be influenced via bribes. Results show that the effectiveness of apprehension hinges on whether higher bribes invite harsher fines. Competition for favors intimidates the bribe giver into offering lower bribes, while greater agency competition has a similar effect on the bribe demanded. Consistent with intuition, better paid bureaucrats demand smaller bribes. Some implications for anti-corruption policy are discussed.

Keywords: corruption, bribe takers, bribe givers, competition, probability, penalty

1 INTRODUCTION

Attention to corruption has heightened in recent years among researchers, policymakers and the general public (see Aidt, 2003; Lambsdorff, 2006; Svensson, 2005; Treisman, 2007). This has occurred due to advances in information gathering and transmission mechanisms leading to greater awareness about corruption and to the relative ease of conducting empirical research. Some nations, such as transition countries and those endowed with certain natural resources, face special challenges in corruption control. However, formal research on corruption, especially at the micro-level, has lagged behind empirical macro analyses (Treisman, 2007).

This paper attempts to add to the literature by examining relative interactions between bribe givers (or favor seekers) and bribe takers (or government officials/bureaucrats). The novelty is in alternately examining whether bribe takers or bribe givers move first in initiating corrupt deals and the consequent impact on the magnitude of bribes or the severity of corruption. The focus of this paper also enables us to study whether the predetermined value of the corrupt “reward” makes a difference to corruption – when the bureaucrat solicits the bribe, the value of the license or permit is likely clear; on the other hand, when the bribe payer moves first by offering a bribe, the value of the favor sought is less likely to be preset. For instance, once the bureaucrat accepts the corrupt offer (or reveals that he’s willing to “deal”), he could potentially offer a range of favors – a better job than the one sought for a higher bribe, admission to a better government college, etc. Understanding of the size of bribes should aid in understanding of the type of corruption – whether it is “petty” or “grand” – and, from a policy perspective, has equity and distributional implications.

Corruption can take many forms. Two common forms involve collusion among corrupt government officials and bribe givers, while extortion involves rent-extraction by bureaucrats with monopoly powers (see Mishra, 2006). Various factors

might determine whether the bribe taker or the bribe giver initiates a corrupt deal. For instance, the first mover in corrupt relations might be determined by the relative discount rates of the two parties, relative bargaining positions, degree of competition, socio-cultural norms, etc. (see Hunt, 2006; Lambsdorff and Teksoz, 2004; Rose-Ackerman, 1999). These factors also influence the magnitude or the size of bribes. For example, under collusion in corruption, either the bribe giver or the bribe taker might move first by offering to collude with the other party to misstate performance (e.g., an inspector approaching a government contractor to approve a substandard dam as meeting standards in exchange for a bribe or the contractor approaching the inspector to obtain the same outcome) or to obtain/offer favors out of turn (e.g., expedited housing permits; early approval of loan applications from public sector banks, etc.). Extortion in corruption occurs when government officials with monopoly powers move first by setting prices for their services (e.g., when they hold monopolies on the award of licenses; sanctioning eligibility for job promotions, etc.). Bureaucrats could also set price tags for performing routine services “after hours” – issuing licenses on weekends. These situations might also occur in hierarchical bureaucracies where officials have “hold-up” powers (Mishra, 2006; Rose-Ackerman, 1999). The scenarios envisioned in the formal model below are consistent with these situations and exhibit many prevalent forms of corruption; however, we cannot claim to cover all possible interactions between bribe givers and bribe takers (see Bertrand et al., 2007; Cadot, 1987; Guriev, 2004 and Manion, 1996) for examples of alternate settings. For instance, while we do not explicitly model information asymmetries across bribe takers and bribe givers, unaware bribe givers might offer bribes to obtain services that they are routinely entitled to (see Manion, 1996).

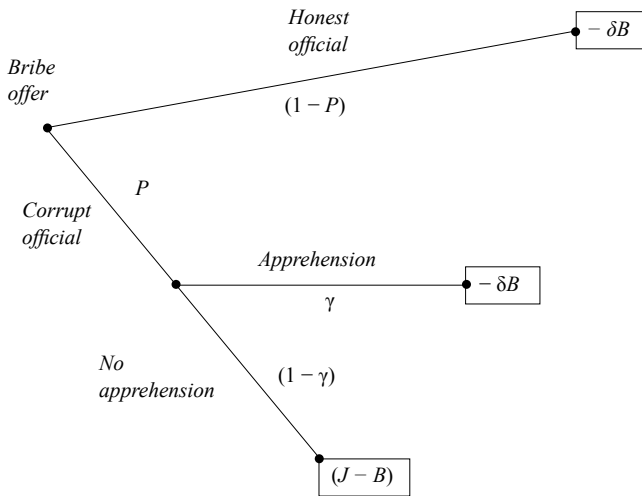
As with other forms of illegal activity, the first mover in corruption (a favor seeker or a favor giver) is uncertain whether the proposal to engage in a corrupt deal would be accepted by the other party. Favor seekers might initiate bribe offers to gain preferential treatment (e.g., obtaining expedited or undeserving services) but they run the risk of their bribe offer being rejected for being too low or the potential recipient (government official) being honest.¹ Bertrand et al. (2007), Goel (2005), Guriev (2004), Lambsdorff (2002) and Lambsdorff and Teksoz (2004) have noted issues related to formation of corrupt relations (also see Andrianova, 2001). Larger bribe offers, *ceteris paribus*, could also induce greater scrutiny and harsher penalties. This is illustrated in figure 1, where the bribe giver is unsure whether the potential recipient (government official) is corrupt or honest. Examples include favor seekers bribing to obtain underage driving licenses (see Bertrand et al., 2007) for an interesting experiment related to corruption in the award of driving licenses) or to acquire false identifications.

¹ While instances involving qualification requirements of potential bribe givers (e.g., driver license seekers (Bertrand et al., 2007), job or admissions seekers) are not explicitly modeled in our setting, one could envision that unqualified applicants would be bribe givers who would move first by offering bribes (also see Cadot, 1987).

On the other hand, government officials, especially those with some monopoly powers in the disbursement of favors, might initiate corrupt deals by putting a “price tag” on different services (see Shleifer and Vishny, 1999).² For instance, officials might drag their feet (increase red tape (see Guriev, 2004)) to grant approvals for pollution permits or property registration deeds. They too have to do a cost-benefit calculation – high bribe demands might induce some potential favor seekers to operate in the shadow economy or go to different (competing) government agencies (Bliss and Di Tella, 1997; Shleifer and Vishny, 1993; Rose-Ackerman, 1999); also, higher bribe demands might invite greater scrutiny and harsher penalties. Figure 2 shows the different steps when the bribe taker bureaucrat moves first. In this instance, the government official moving first by setting prices for services offered is unsure whether a corrupt deal would eventually materialize.

FIGURE 1

Corruption: bribe giver moves first



Note: J = payoff; B = bribe offer; P = probability of corrupt deal; γ = probability of apprehension; δ = penalty.

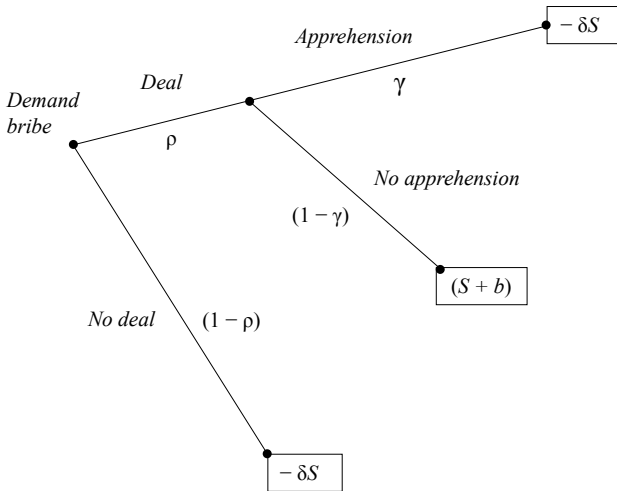
Both bribe givers and bribe takers in corrupt deals have to contend with the chances of getting caught and, upon apprehension, the expected punishment for corruption – apprehension without credible punishment is not very effective (see Banerjee, 1997; Becker, 1968; Becker and Stigler, 1974; La Porta et al., 1999; 2004). These apprehension chances (probability of getting caught) and punishment might be set (exogenous) or the judicial mechanism itself might be corrupt (Benson, 1988; Goel and Nelson, 2007; Mookherjee and Png, 1995; Priks, 2011). In our

² This scenario is similar to the case of a corrupt auction by a monopolist bureaucrat. Some scholars have considered the case where the auctioneer, rather than the buyer or the seller, might be corrupt (Lengwiler and Wolfstetter, 2006).

analysis, the detection rates and punishments are assumed to be the same whether the bribe taker or the bribe giver moves first – the anti-corruption bodies in charge of checking corruption are mainly interested in reducing corruption and are generally less concerned with (or largely unable to detect) who initiated the corrupt deal.

FIGURE 2

Corruption: bribe taker moves first



Note: S = bureaucrat's salary; b = bribe demanded; ρ = probability of corrupt deal; γ = probability of apprehension; δ = penalty.

Besides contributing to the literature, this work has some policy value – in the absence of the ability to eradicate corruption entirely, under what conditions can government actions make corruption less severe (by reducing the magnitude of bribes)? The severity of corruption is the other dimension of corruption research that has mainly focused on the prevalence of corruption. The magnitude of bribes strikes at fairness issues associated with corruption – lower bribes make corrupt acts affordable to a larger set of potential favor seekers. The formal model follows.

2 THE MODEL

We consider two scenarios – allowing the bribe giver (denoted by superscript g) and the bribe taker (denoted by superscript T) alternately to initiate the corrupt deal, each party unaware whether the offer would be acceptable to the other party.³

³ Both the giver and taker are assumed to have similar attitudes towards risk and are assumed, for analytical tractability, to be risk neutral.

The probability of apprehension or detection for corrupt acts, γ , is exogenous – the bribe taker and the bribe giver are unable to influence their chances of being apprehended. However, the severity of punishment for corrupt acts once caught, δ , is sensitive to the size of the bribe (both bribe offered and bribe received). In a largely corrupt economy with a corrupt judiciary, the derivative of δ with respect to the bribe would be negative, but it would be positive when the authorities have a zealous attitude towards eliminating corruption and it would be zero in a case in which the punishment is set – akin to a *per se* illegality clause. The punishment can be a monetary fine or it may be thought of as the monetized (present-discounted) value of incarceration (alternately, demotion or suspension from a job). The probability of detection is determined by the efficacy of policing, while corrections and judicial employment determine and enforce penalties.⁴ See figures 1 and 2 for various scenarios facing the bribe giver and the bribe taker, respectively.

2.1 SUPPLY-PUSH BRIBERY: BRIBE GIVER MOVES FIRST

In this instance the bribe giver or the favor seeker initiates the corrupt deal by offering a bribe. The paper by Guriev (2004) examines a related, somewhat narrower, aspect where a bribe is offered to a bureaucrat to reduce the degree of red tape. The bribe offer is denoted by $B > 0$ and is assumed to be one-shot or a one-stop corrupt shop of the corrupt bureaucrat.⁵ Potential payoff from the corrupt deal is denoted by J , such that $J(B)$, $J_B > 0$, $J_{BB} < 0$, and $J(0) = 0$. In other words, larger bribes can increase the payoffs and there are no corrupt returns without bribe offers – the corrupt payoffs are contingent upon successful corrupt contracts. $J > B$ makes engaging in corrupt activity worthwhile for the giver and it follows then that $J_b > 1$ – i.e., the marginal return to a bribe is greater than one. The payoffs might include awarding oil-drilling rights to firms who are not qualified or giving construction permits to blacklisted contractors, etc. Larger bribes, for example, might enable one to procure rights to larger, more lucrative drilling tracts.

The giver is unaware whether the bribe would be acceptable to the government official – not all government officials are corrupt. Let P denote the probability that the bribe offer will be accepted by the government official. Higher bribe offers increase the chances of acceptance $P_B > 0$, and $P_{BB} < 0$. To introduce competition for favors, the probability P is also dependent on the given number of favor seekers (N), such that a giver's probability of striking a corrupt deal diminishes with more seekers ($P_N < 0$, and $P_{NN} \geq 0$).⁶ The cross-effects term P_{BN} might be positive, negative or zero depending upon whether the competition for favors increases, decreases or leaves unchanged the marginal effect of a bribe on the probability of a successful deal.

⁴ Goel and Nelson (2007) empirically consider the relative effects of these types of government employment on corruption in the United States. Also see Alt and Lassen (2008).

⁵ A dynamic analysis with multiple points of bribe payoffs would involve a much more complex analysis that could also allow for the possibility of a bureaucratic hold-up at some stage(s) of the process.

⁶ One specific functional form that satisfies the marginal conditions is $P = B^\alpha/N$, with $0 < \alpha < 1$. Further, one could alternately have the bribe offer depend directly on the number of givers, although that would require greater informational requirements on the giver.

Given this background, the bribe giver tries to maximize the payoff from the one-shot bribe offer by weighing the relative costs and benefits of success. The expected payoff (π^g) is the sum of expected net returns from striking a corrupt deal, which are the sum of expected payoff (loss) from detection and consequent punishment, $P\gamma B(-\delta)$, and the payoff from escaping detection, $P(1-\gamma)(J-B)$; minus the penalties in case of no deal, $\delta B(1-P)$. It is assumed that the deal falls through mainly because the government official is honest (or pretends to be so because the bribe is too low) and all honest officials report the bribe giver to the appropriate authorities.⁷ Figure 1 illustrates the options of the bribe giver.

Formally, the bribe giver chooses the bribe size B to maximize payoff π^g

$$\begin{aligned} \max_B \pi^g &= P\{\gamma B(-\delta) + (1-\gamma)(J-B)\} - \delta B(1-P) \\ &= P(J-B)(1-\gamma) - \delta BzI \end{aligned} \quad (1)$$

$$[J > B \rightarrow (1-J_B) < 0; zI \equiv \{P\gamma + (1-P)\} > 0]$$

Simplification of the corresponding first-order condition ($\pi^g_B = 0$) yields

$$B^* = [(1-\gamma)\{JP_B + P(J_B - 1)\} - \delta zI] / [P_B(1-\gamma) + \delta_B zI + \delta P_B(\gamma-1)] \quad (2)$$

Recognizing that, given the general functional forms used here, B^* is not in a reduced form, a sufficient condition for B^* to be positive requires $\delta_B \geq 0$; $\delta < 1$; and $\delta < (1-\gamma)[JP_B + P(J_B - 1)]/zI$. In other words, for a positive bribe offer to be forthcoming, the potential punishment should be relatively low.

Further, sufficient condition for satisfaction of the second-order maximization condition (i.e., $\pi^g_{BB} < 0$) requires that $\delta_B \geq 0$; $\delta_{BB} \geq 0$; $P_{BB} \leq 0$; and $\epsilon_p \equiv P_B B/P \leq J_{BB} B/2(J_B - 1)$.⁸ For a maximum, the punishment should be fixed or incremental and the probability of the deal should be somewhat inelastic or unresponsive to the bribe. Intuitively, from the bribe giver's perspective, the probability of acceptance of the corrupt deal is likely to increase when the bureaucrat (bribe taker) is facing the end of her tenure due to retirement or a change in political leadership.⁹ Then a small increase in the bribe offered would, *ceteris paribus*, be more likely to elicit a positive response from the official.

⁷ One could, without loss of generality, introduce another possibility in the model by introducing an exogenous probability where the government official who rejects the bribe chooses to report the bribe giver. In a multi-period corrupt relation, the honest official might choose to not report the bribe offer in anticipation of a future corrupt deal or to not harm her "corrupt reputation". The official might also reject and not report if an alternate bribe offer has been accepted – this aspect is somewhat captured by $P_N < 0$.

⁸ In the special case $P = B^*/N$, $\epsilon_p = \alpha$.

⁹ Bureaucrats facing retirement could accept bribes when they play "end period games" with relatively less chances of punishment or retribution.

We determine the comparative-static effects on the equilibrium bribe offers of changes in the number of bribe givers (N) and probability of detection (γ). How does the bribe offered respond to changes in the number of potential givers and detection rates?

2.1.1 Effect of a change in competition for favors

Changes in the number of qualified bidders or increases in population can increase the competition for favors. A greater number of favor seekers induce some to offer bribes to jump the queue. By employing the implicit-function rule, the comparative-static effect of a change in N is denoted by

$$(\partial B/\partial N) = -\pi_{BN}^g / \pi_{BB}^g \quad (3)$$

Given that the second-order condition is satisfied (i.e., $\pi_{BB}^g < 0$), the sign of $(\partial B/\partial N)$ will be the sign of π_{BN}^g .

$$\pi_{BN}^g = P_{BN}(1-\gamma)[(J-B) + B\delta] + P_N(1-\gamma)[(J_B - 1) + \delta + B\delta_B] \quad (3A)$$

π_{BN}^g and consequently, $(\partial B/\partial N)$ would be negative when $P_{BN} \leq 0$.¹⁰ When the impact of greater competition on the marginal probability of the deal is negative ($P_{BN} < 0$) – i.e., greater competition dampens the marginal effect of a higher bribe on the probability of the deal, the optimal bribe offered declines with competition. Intuitively, greater competition sufficiently lowers the expected benefits (via a decrease in the likelihood of a corrupt deal) that the bribe giver is induced to offer a lower bribe. There is some empirical support for the competition for favors where studies of corruption determinants have included population as a regressor, although the statistical significance of the estimated effect is mixed (Fisman and Gatti, 2002; Glaeser and Saks, 2006).

2.1.2 Effect of a change in the probability of detection

The chances of being caught for engaging in corrupt acts might change when new governments come to power with corruption control on their agendas or greater attention is paid to enforcement. International mandates might also induce nations to bolster their anti-corruption efforts. Further, technological advances, such as the Internet, might empower anti-corruption efforts by making it easier to detect corrupt acts as locational monitoring constraints are somewhat mitigated in the cyberspace. Proceeding in a fashion similar to that noted above, the effect of a change in the given probability of detection is given by

$$(\partial B/\partial \gamma) = -\pi_{B\gamma}^g / \pi_{BB}^g \quad (4)$$

$$\text{Here} \quad \pi_{B\gamma}^g = -P_B[(J-B) + B\delta] + P[(1-J_B) - \delta - B\delta_B] \quad (4A)$$

¹⁰ In special cases, $P_{BN} < 0$ with $P = B^a/N$; and $P_{BN} = 0$ when $P = B^a + 1/N$.

$\pi_{B\gamma}$ would be negative when $\delta_B \geq 0$, or with the satisfaction of the second-order maximization conditions. Greater apprehension probability lowers the size of the bribe offered when the punishment is set (non-negotiable) or progressive.

We see that the magnitude of bribe offers is sensitive to the change in parameters. Under certain conditions, competition for favors lowers bribe offers. Apprehension is effective in reducing bribe sizes when punishments are predetermined or progressive according to the magnitude of bribes.

2.2 DEMAND-PULL BRIBERY: BRIBE TAKER MOVES FIRST

Now we shift focus to the bribe taker by allowing for explicit rent-extraction. Public officials with monopoly powers over disbursements of contracts and other favors are in a position to set bribes or prices for their services (e.g., see Cadot, 1987). The solicited bribe is denoted by b and it affects the probability of the corrupt deal ρ , which is also dependent upon the number of competing government agencies (n); i.e. $\rho(b; n)$ and $\rho(0; n) = 0$.¹¹ For instance, there may be more than one agency capable of awarding leases on government lands (Rose-Ackerman, 1999; Shleifer and Vishny, 1993; 1999). This occurs when government agencies have overlapping jurisdictions. Interestingly, the spread of the Internet has enabled some people to bypass government officials by conducting some government business in cyberspace (see Goel et al., 2012). In this case, for a government official seeking a bribe, the presence of the Internet can be seen as a competing government agency that undermines his/her power to solicit a bribe.

Other things being the same, a higher bribe demand lowers the probability of a corrupt deal by making bribes unaffordable for some favor seekers ($\rho_b < 0$, with $\rho_{bb} < 0$), and greater agency competition lowers the bribe demanded (otherwise, an agency would lose to competing agencies) $\rightarrow \rho_n < 0$, with $\rho_{nn} \geq 0$. Further, there is no a priori good fix on the sign of the cross effects term ρ_{bn} – it could be positive, negative or zero. As noted above, the probability of detection (γ) and the severity of punishment (δ) are the same, irrespective of who initiates the corrupt deal.

In demanding a bribe, the bureaucrat has to weigh the expected benefits from a corrupt deal against the expected costs from detection and punishment. Failure to arrive at a deal can result in the corrupt bureaucrat being reported, resulting in the loss of the set bureaucratic (lawful) salary S . The reporting of the bureaucrat seems especially plausible in a one-period case considered because of the absence of a threat of future backlash. The bribe taker's options are illustrated in figure 2.

Formally, the bribe taker seeks to maximize π^T by choosing the bribe demand (b), where

¹¹ It is likely that the number of favor seekers (N) is generally greater than the number government agencies (n).

$$\begin{aligned} \max_b \pi^T &= (1 - \rho)S(-\delta) + \rho[\gamma S(-\delta) + (1 - \gamma)(S + b)] \\ &= -S\delta z_2 + \rho(1 - \gamma)(S + b) \end{aligned} \quad (5)$$

Where $z_2 \equiv [(1 - \rho) + \rho\gamma] > 0$.

Here $(1 - \rho)S(-\delta)$ is the expected payoff (loss) with no deal and $(S + b)\rho[1 - \gamma]$ is the expected payoff when the corrupt deal is made and the bribe received, while $\rho\gamma(-\delta S)$ is the penalty upon apprehension.

The corresponding first-order condition, $\pi_b^T = 0$, yields

$$b^* = [S\{\delta_b z_2 - \delta\rho_b(1 - \gamma)\} - (1 - \gamma)(\rho + S\rho_b)] / (1 - \gamma)\rho_b \quad (6)$$

A positive bribe is demanded ($b^* > 0$) when the bureaucrat's salary is sufficiently low or when

$$S < \rho(1 - \gamma) / [M - (1 - \gamma)\rho_b]; \text{ where } M \equiv \delta_b z_2 - \delta\rho_b(1 - \gamma) > 0 \text{ when } \delta_b \geq 0.$$

The second-order condition for a maximum, $\pi_{bb}^T < 0$, is satisfied when $\rho_{bb} \leq 0$; $\delta_b \geq 0$; and $\delta_{bb} \geq 0$. Turning to the comparative-static effects on the magnitude of the solicited bribe, we consider first the effect of agency competition.

2.2.1 Effect of agency competition on the bribe demanded

As mentioned above, agency competition can change when more government services are transacted on the Internet. Also, the restructuring of government agencies and their responsibilities has been especially prevalent in transition nations, particularly in the early transition years. Employing the implicit function rule, gives the following relation

$$(\partial b / \partial n) = -\pi_{bn}^T / \pi_{bb}^T \quad (7)$$

Given the second-order condition, the sign of $(\partial b / \partial n)$ would be the same as the sign of π_{bn}^T . From (7)

$$\pi_{bn}^T = (1 - \gamma)[\rho_n(S\delta_b + 1) + \rho_{bn}(S\delta + (S + b))] \quad (7A)$$

$\pi_{bn}^T < 0$ when $\rho_{bn} \leq 0$. Under these conditions, greater agency competition reduces the magnitude of solicited bribes – competition works, even in markets for corrupt deals.¹² Competition lowers the probability of a deal and affects the marginal effect of the bribe demanded on the deal probability (see Shleifer and Vishny, 1993). Accordingly, an increase in competing agencies (a greater number of jurisdictions) sufficiently lowers the expected payoffs from corruption and induces the

¹² See Priks (2012) for theoretical arguments regarding the different effects of agency competition.

bureaucrat to demand a lower bribe. While Svensson (2005) and others (e.g., Goel and Nelson, 2011) have discussed why corruption might diminish with greater competition, this research focuses on the severity of corruption.

2.2.2 Effect of higher probability of apprehension on bribe demanded

Effective internal affairs departments can increase apprehension probabilities for corrupt police departments. To determine the effect of higher apprehension probability (γ) on the bribe demanded, we have

$$\text{Sign} (\partial b/\partial \gamma) = \text{Sign} \pi_{b\gamma}^T \quad (8)$$

where

$$\pi_{b\gamma}^T = -\rho(S\delta_b + 1) - \rho_b(S + b + S\delta) \quad (8A)$$

$$\pi_{b\gamma}^T < 0 \text{ when } [(S\delta_b + 1)b/(S\delta + b + S)] > -\epsilon_\rho > 0$$

In other words, harsher punishments lower the bribe demanded when the elasticity of deal (acceptance) probability is modest. Intuitively, the bribe taker might expect a lower bribe demand to generate a smaller response (relative inelasticity) in the probability of a corrupt deal when the bribe giver expects a political regime change that might yield more favorable future outcomes (read cleaner government). For instance, “lame duck” bureaucrats can expect lower responsiveness to their bribe demands.¹³

2.2.3 Effect of a change in bureaucratic compensation

Next we study the effect of an increase in the bureaucrat’s salary on the size of the bribe demanded. Bureaucratic salaries are often set and changes have often to be approved by legislatures. Proceeding in the same manner as before

$$\text{Sign} (\partial b/\partial S) = \text{Sign} \pi_{bS}^T \quad (9)$$

where

$$\pi_{bS}^T = -\delta_b z 2 + \rho_b(1-\gamma)[1 + \delta] < 0 \text{ with } \delta_b \geq 0, \quad (9A)$$

or with second-order conditions.

Higher salaries make bribe demands less attractive – there is some substitution between legal income and corrupt earnings. Goel and Rich (1989) provide some related evidence from the United States.

¹³ Alternately, the probability of securing the deal might not change very much with the bribe demanded when the favor offered by the bureaucrat is uniform and each favor seeker can obtain fixed units – e.g., one permit/license per person, one preferred parking permit, etc.

To summarize, we have considered different cases allowing the bribe giver to initiate the corrupt relation by offering a bribe, and then alternately allowing a bureaucrat to initiate by soliciting a bribe. In all scenarios, the focus has been on determining the severity of corruption. We find that anti-corruption policies are effective in reducing the severity of corruption under certain circumstances. The concluding section follows.

3 CONCLUDING REMARKS

Formal economics research on criminal behavior dates back to the seminal work of Becker (1968); however, research on corruption is more recent (see Lambsdorff, 2006; Treisman, 2007). In this context, theoretical work has somewhat lagged behind empirical investigations of corruption. This paper develops a simple model to examine the effects on the severity of corruption when bribe takers or bribe givers initiate corrupt deals. While the extant literature has largely focused on the prevalence of corruption (e.g., Priks, 2012; Svensson, 2005), rather than its severity, these scenarios are consistent with collusion among bribe takers and bribe givers and with extortion by bureaucrats (Ahlin and Bose, 2007; Mishra, 2006; Rose-Ackerman, 2010; Shleifer and Vishny, 1993; 1999). For instance, the first mover in corrupt relations might emerge due to numerous factors including the relative discount rates of the two parties, relative bargaining positions, degree of competition, socio-cultural norms, etc. Both parties weigh the relative costs and benefits of their actions including factoring in that the corrupt relation might not be acceptable to the other party and that there is some risk of apprehension and consequent punishment (figures 1 and 2).

Two scenarios of corrupt dealings are considered: (1) a competitive bribe giver moves first (e.g., bribes offered to buy a place in the queue); and (2) a competitive bribe taker moves first (e.g., offers by bureaucrats to collude with bribe givers). Generally, the timing of bribes is not empirically observable, unless one has access to data on individual bribe transactions. In an interesting recent study, Goel et al. (2013) were able to analyze such data from Croatia. Besides this novelty, corruption issues in Croatia are interesting due it being a transition country. The authors show how a monopolist bureaucrat is able to affect the timing and the nature of bribes.

Results show that positive bribes are forthcoming when punishments and bureaucratic salaries are low. When the bribe giver initiates the corrupt deal, greater competition among favor seekers lowers the bribe offered provided the marginal effect of the bribe is somewhat insensitive to competition. In the context of the literature, we are able to show the effect of competition on the severity of corruption, rather than on its prevalence (Svensson, 2005). Apprehension is shown to be effective in reducing bribe offers.

With the bribe taker initiating the corrupt deal, greater competition among government agencies (competing jurisdictions) lowers the bribe demanded again when the deal probability is relatively inflexible to agency competition.¹⁴ Greater apprehension probability lowers the bribes demanded when the probability of securing the corrupt deal is somewhat unresponsive (inelastic) to the bribe demanded. The probability of securing the deal might not change very much with the bribe demanded when, with a given number of jurisdictions, the favor offered by the bureaucrat is uniform and each favor seeker can obtain fixed units – e.g., one permit/license per person, one preferred parking permit, etc. Alternately, a “lame duck” bureaucrat can expect lower responsiveness from the bribe giver to her bribe demands.¹⁵ Finally, consistent with intuition, higher bureaucratic salaries reduce bribe demands.

Besides contributing to the literature, this work has some policy value. In the absence of the ability to eradicate corruption universally, policymakers might look to make it somewhat benign by lowering its severity. Greater competition among bribe takers and bribe givers reduces the bribes – thus making bribes more affordable for more givers.¹⁶ In general, apprehension is shown to be effective no matter who initiates the corrupt deal. However, for this to happen, a “clean” judiciary seems necessary. Similar results are also seen with greater agency competition, although it may be more expensive in some cases to maintain competing agencies. Further, increases in bureaucratic salaries to keep them at somewhat on a par with their private sector counterparts seem to constitute an effective counter-corruption strategy (see Goel and Rich, 1989).

In closing, some potential extensions to this work are suggested. One limitation of this analysis is that repeated corrupt interaction between the parties is not considered, which might lead to reputation effects (Andrianova, 2001; Basu et al., 1992; Buccirossi and Spagnolo, 2006; Dixit, 2004; Yoo, 2008). One could also include a middleman in corrupt dealings (see Bertrand et al., 2007; Guriev, 2004; Lambsdorff and Teksoz, 2004). Second, the model considered in this study is a partial equilibrium one and social welfare implications of changes in corruption are not formally considered. Further, access to micro-level data might enable one to test some of the assumptions of this study (see Goel et al., 2012; 2013; Mocan, 2008). Finally, a simplification is the consideration of a single window for the bribe. In practice a series of bribes might have to be paid to accomplish one corrupt deal.

¹⁴ In different settings, Bliss and Di Tella (1997) and Priks (2012) have shown that greater competition might not necessarily lower corruption.

¹⁵ As a practical matter, however, this elasticity may be difficult to observe for enforcement bodies, although one can expect the elasticity to change when bureaucrats face the end of their tenures, voluntarily or otherwise.

¹⁶ This policy implication is somewhat tempered by the fact that in practice not all anti-corruption agencies might be completely independent or have corruption reduction as their sole objective – i.e., they might themselves be interested in garnering rents.

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Financiranje velikih gradova

Financing large cities

TEREZA ROGIĆ LUGARIĆ

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Croatian literature in the field of public finance has been prolific in the last ten years. Public finance as a discipline is at the centre of attention not only of economists, but also of other authors in the field of social sciences as well. One of them is Tereza Rogić Lugarić, from the Faculty of Law, University of Zagreb, author of *Financiranje velikih gradova* (Financing large cities).

Public finance represents a demarcation between the political and the economic function of government. This problem is exacerbated when it comes to financing units of local government in Croatia. The country is politically and administratively decentralized, with 20 counties and the capital city, Zagreb, classified as regional self-government units, and 126 cities and 429 municipalities as local self-government units. The author explores the question of financing large cities, which is a problem from the start due to difficulties with defining a “large city” in Croatia and putting it into a comparable international context. For example, the city of Zagreb is a unique territorial and administrative unit that carries out activities assigned to counties and cities. On the other hand, Croatian legislation usually appoints the status of a large city to economic and cultural centers with a population more than 35,000 (15 cities in total have this status, Zagreb not included). It is evident how “large” these cities are in comparison to the multimillion cities of the world. These demographic and territorial grounds for defining a large city do not have to be in sync with the economic importance of the city for a certain region and/or country.

After the *Introduction*, the author discusses this and similar problems in the second chapter of the book – *Theoretical Grounds for Differentiating Cities by Size*. The process of urbanization, i.e. the phenomenon causing the expansion of the urban way of living, is the main reason behind the need for isolated observation of large cities. It is followed by the typology of cities by size and population (cities are classified as large, medium and small). Furthermore, the author analyses the grounds for the economic differentiation of cities and gives examples of the differentiation of cities in France, Germany, Great Britain, Austria and the U.S.

The third chapter – *A Comparative Overview of Financing Large Cities* – analyses the financing of cities from three aspects. The first arises from the principles and functions of large cities, i.e. the model of local self-administration in a certain country. The emphasis is on the possibilities of collecting current revenue (local taxes), intergovernmental fiscal transfers (grants) and the use of collected funds through financing urban infrastructure. The second aspect is related to a comparative overview of authorities in governing revenues and expenditures in European cities. The third part of the chapter analyses the financing of local units of government in France, Austria and the U.S., with an emphasis on the place and role of large cities in these systems.

The first three chapters provide a theoretical framework for the analysis and the comparative overview established certain standards when it comes to financing large cities. The fourth part – *Normative Framework of Large Cities in the Republic of Croatia* – gives an overview of the complex Croatian legislation that determines the activities of local self-administration. Firstly, it analyses the legislation that defines the constitution and the field of authority of large cities, as well as the laws that regulate the system of (public) finance, own sources of funds and budget policy of cities as units of local self-administration. The author also lists a set of other acts, bylaws, charters and other statutes that regulate cities in Croatia. Those statutes are associated with special sectors, areas or questions (e.g. forests, agriculture, public-private partnerships, concessions, public procurement, areas of special state concern) which are important for financing large cities in Croatia.

The fifth chapter – *Financing of Public Needs in Large Croatian Cities in the Period 2002-2006* – is the main part of the book. The analysis comprises six cities: Zagreb, Split, Rijeka, Osijek, Zadar and Varaždin. Besides the basic data for every city, it includes an analysis of the budget (according to economic and functional classification) and an analysis of the financing of local self-administration and certain non-fiscal instruments of financing (municipal bonds).

In the sixth chapter – *Comparative Analysis of Large Croatian Cities' Budget in the Period 2002-2006* – the author continues the analysis by comparing the aforementioned cities. She emphasizes the main differences between these cities, and takes into consideration special characteristics and the position of cities due to political, economic and other surroundings and forms an appropriate conclusion.

In *Conclusion*, the author once again brings out the most important results presented in the book. Firstly, there is a hybridity of the position of cities in modern societies, especially in the context of interior, functional, administrative and territorial and constitution. Secondly, there are limitations in the Croatian approach in defining cities as a local unit due to its size and population, as well as the model of local self-administration, which classifies cities and counties as units of regional self-administration. Lastly, budget funds are directed to maintaining communal and other activities, while its relation to developing large cities is uncertain, i.e. subordinated to administrative obligations. It is not possible successfully to finance city development with the existing budget model.

As mentioned in the introduction, Croatian literature in the field of public finance is becoming more and more prolific. There are a large number of books and other publications dealing with the problems of local public finance and fiscal decentralization. This book represents a new contribution to the topic as it elaborates a narrow area (large cities) and contains a new dimension that observes financing large cities through the process of urbanization and administrative constitution. Thus one can say that Tereza Rogić Lugarić has created a valuable read which will

be of great use in familiarizing oneself with the complex problem of financing large cities. This book can serve everyone interested in the problem of local public finance – researchers, college professors, students, employees and executives in city administrative bodies in Croatia.

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